PRELIMINARY ENGINEERING REPORT

FOR

LAKE SHORE PARK MARINA CONSTRUCTION PROJECT

ASHTABULA, OHIO

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PREPARED FOR:

ASHTABULA TOWNSHIP
PARK COMMISSIONERS

ASHTABULA COUNTY
BOARD OF COMMISSIONERS

THIS REPORT WAS PREPARED AS A PORTION OF A LOAN APPLICATION FOR CONSTRUCTION FUNDS TO THE OFFICE OF COASTAL ZONE MANAGEMENT, NOAA, U.S. DEPARTMENT OF COMMERCE WITH FUNDING PROVIDED BY THE COASTAL ENERGY IMPACT PROGRAM THROUGH THE OHIO DEPARTMENT OF ENERGY.

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SECTION I

REQUIREMENT

REQUIREMENT FOR THE PROPOSED PROJECT

Lake Shore Park is a recreational asset to the Northeast Ohio area. The Ashtabula Township Park Commission, the Ashtabula County Planning Commission and the County Commissioners recognized the need to develop a plan to protect Lake Shore Park from current and potential impacts of adjacent energy-related industrial activities including the Cleveland Electric Illuminating Company's generating plant, oil storage facilities, and coal transhipment facilities. To this end, a comprehensive plan, the Lakeshore Park Recreation Plan[1], has been developed. The objectives of the Plan are to improve and broaden the recreational activities available in the Park. This study was completed under a CEIP (c)(1) planning grant.

This project, a public recreational small-boat marina is one of the proposed improvements in the Park. A number of studies have been done concerning marinas in Northeast Ohio. All of these studies have found 99% occupancy of existing facilities and stated the need for additional dock space. A demand analysis demonstrating the present need for additional recreational dock spaces is included in this report. Construction of this marina would expand recreational boating opportunities and help meet the present demand for slips.

1 Lakeshore Park Recreation Plan, Woodruff, Inc. for Ashtabula County Commissioners and Ashtabula Township Park Commission

SECTION II
PROJECT DESCRIPTION

SITE DESCRIPTION

Location

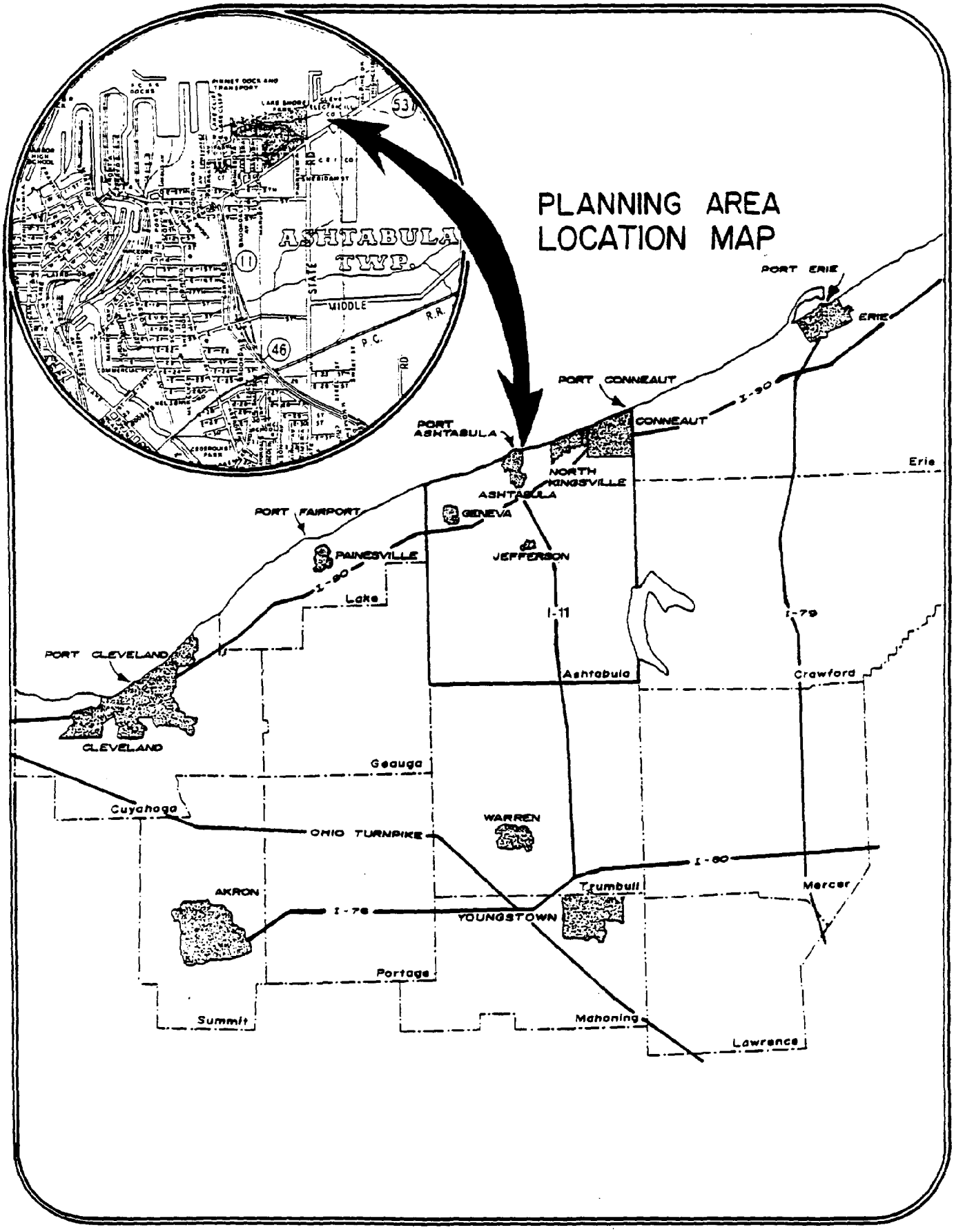
The proposed marina is located in Lake Shore Park on Lake Erie in Ashtabula, Ohio. The park is approximately 56 miles east of Cleveland, Ohio; 50 miles north of Youngstown, Ohio and 45 miles west of Erie, Pennsylvania. Regional and local locations are shown on Map 1 entitled "Planning Area Location Map" from the Lake Shore Park Recreation Plan.

The Park is on the eastern edge of the City of Ashtabula. Immediately to the west on the Lakefront is Pinney Dock and Transport Company and Ashtabula's deepwater harbor. These facilities are capable of handling oceangoing freighters. Ashtabula harbor's east breakwater extends east past the Pinney docks toward the project site. To the east is Cleveland Electric Illuminating Company's Ashtabula generating plant with its intake and outflow structures extending into the Lake. To the south of the proposed marina is Lake Shore Park and further south, residential neighborhoods.

Lake Shore Park is a multiple use facility. Present Park facilities include two boat launching ramps, a pavillion and concession stand, a children's playground, picnic facilities, tennis courts, baseball diamonds and more. Active planning has been done to improve and expand the Park facilities via the Lakeshore Park Recreation Plan. Improvements recommended in this plan that are presently under development leading to construction are replacement of the existing boat ramps and providing a paved parking lot, reconstruction of the beach which was lost due to erosion, and a modernized playground. The addition of a marina to the Park would further broaden the recreational options available.

Soil Conditions

The soils at the Lakefront are mostly made land. Under this was found hard durable shale. Sediments overlie the rock on the west side of the project site. Appended are the Soils Report and pertinent correspondence with the soils consultant.


PLANNING AREA
LOCATION MAP
ASHTABULA
TWP.
STATE
MIDDLE
R.R.
P.C.
RD
11
46
531
PORT ERIE
ERIE
PORT CONNEAUT
CONNEAUT
I-90
PORT
ASHTABULA
NORTH
KINGSVILLE
ASHTABULA
GENEVA
PORT FAIRPORT
PAINESVILLE
JEFFERSON
I-90
Lake
I-11
I-79
Erie
PORT CLEVELAND
CLEVELAND
Ashtabula
Crawford
Geauga
Cuyahoga
OHIO TURNPIKE
WARREN
I-80
AKRON
I-76
YOUNGSTOWN
Trumbull
Mercer
Portage
Summit
Mahoning
Lawrence

Map 1

Existing Ownership/Improvements

There are no problems for this site with regard to land or right-of-way acquisition. All access will be through Lake Shore Park which is owned by the Ashtabula Township Park Commission, the sponsors of the marina project. All the additional land needed for the marina is submerged land in Lake Erie. The State of Ohio owns this land so that a lease must be obtained for the required area in the lake. Application for such a lease is being made and no problems are anticipated.

SITE ACCESS

Highway

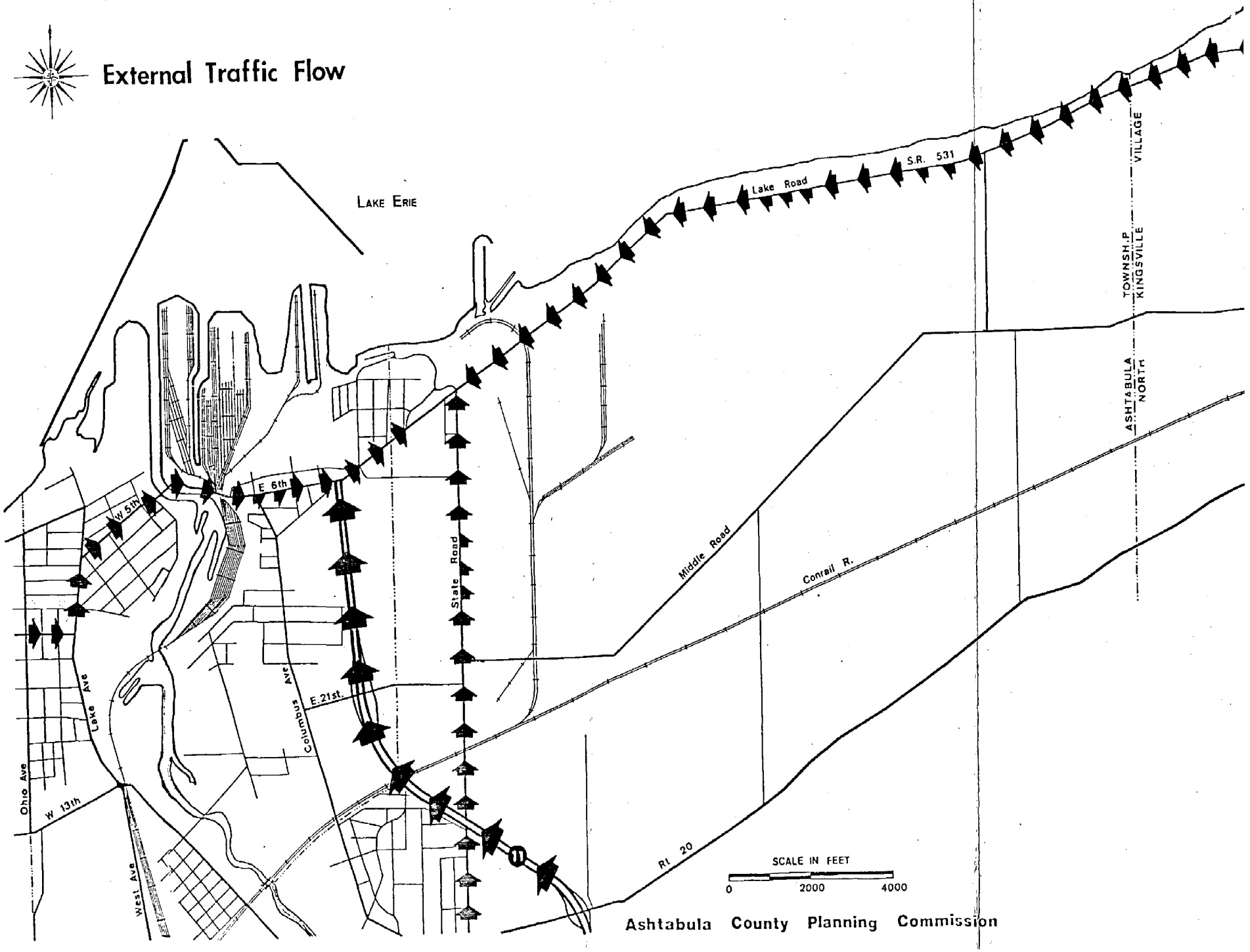
State Route 531 (Lake Road) runs along the front of Lake Shore Park. Access to the marina site is on park roads and city surface streets. As stated in the Recreation Plan, some slowdowns may be expected on park roads on peak user days (e.g. holidays) but even these should be tolerable. With the marina located east of downtown Ashtabula, local traffic disruption should be minimal. State Road (Ashtabula County road) ends at Lake Road directly across from the eastern park entrance. See Map 4 "External Traffic Flow" prepared by the Ashtabula County Planning Commission.

Regional access is excellent in that State Route 11, a four lane limited access highway, ends at Lake Road (S.R. 531) within one quarter of a mile of the park minimizing local traffic interference. State Route 84 and U.S. Route 20, major east-west roadways, are connected to S.R. 11. More importantly, Route 11 is directly connected to Interstate Route 90 south of Ashtabula. This provides a direct, limited access highway route from Cleveland, Ohio or Erie, Pennsylvania and all the area between which is connected to Interstate 90. Such a route reduces travel time and is convenient and easy to use. See Figure II-1, a map showing regional highway access.

ASHTABULA AREA

Map 4

External Traffic Flow



Ashtabula County Planning Commission

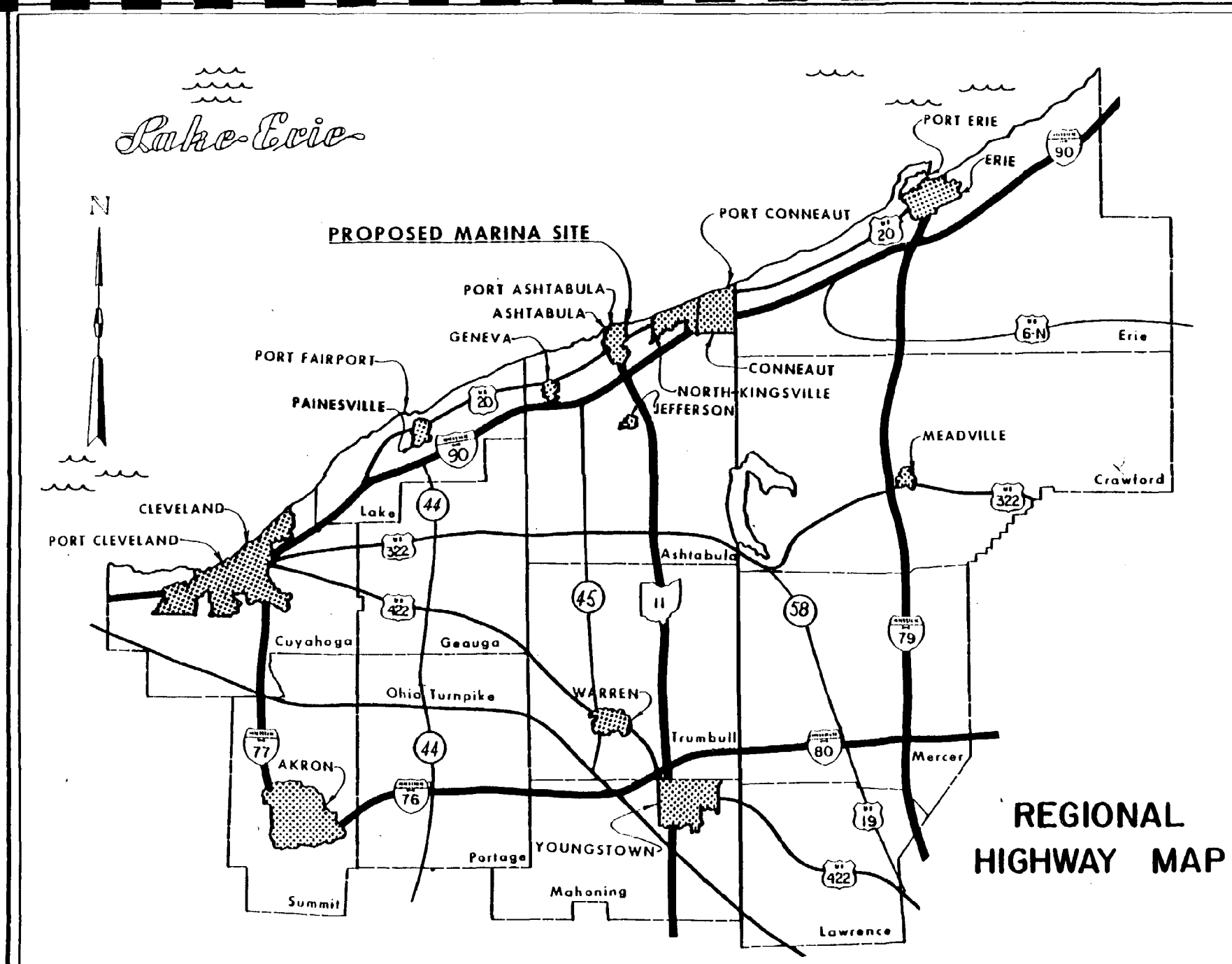

Lake Erie
N
PROPOSED MARINA SITE
PORT ERIE
ERIE
PORT CONNEAUT
PORT ASHTABULA
ASHTABULA
GENEVA
PORT FAIRPORT
PAINESVILLE
CONNEAUT
NORTH KINGSVILLE
JEFFERSON
MEADVILLE
Erie
Crawford
CLEVELAND
PORT CLEVELAND
Lake
Ashtabula
Cuyahoga
Geauga
Ohio Turnpike
WARREN
Trumbull
Mercer
AKRON
Portage
YOUNGSTOWN
Summit
Mahoning
Lawrence
REGIONAL
HIGHWAY MAP

FIG. II-1

The proposed extension of the Lakeland Freeway (S.R. 2) from Painesville to S.R. 11 would add another major east-west route for regional access.

It can be seen that both local and regional highway access are excellent at present and should remain so with future increases in traffic. Most of the roadways involved are capable of larger volumes than they are presently carrying.

Water

This site will provide direct access onto Lake Erie. Presently, most of the marinas in Ashtabula are located upstream on the Ashtabula River, see Figure II-2. When a boater wishes to go out on the Lake he must travel down the river, with its 6 mph speed limit, through Ashtabula Harbor which has a 10 mph speed limit, and then out onto Lake Erie. Compounding the problem for large powerboats and sailboats are the two lift bridges on the river. The first upstream is the S.R. 531 lift bridge which opens on the half hour when necessary. Boaters must schedule boat trips accordingly or spend their time waiting for the bridge to open. Further upstream is the Conrail lift bridge. On a tour of the existing marinas on the Ashtabula River, the author experienced the kind of delays that can occur. Passage is obtained by signalling an operator who raises the bridge. In attempting to return down river we experienced a 45 minute delay. A coal train had pulled in for off-loading and extended past the bridge so that it could not be raised. Such delays are not only inconvenient but also dangerous in creating boating bottlenecks on the river. Ashtabula is a busy harbor capable of accommodating ocean-going vessels and large ore freighters. The boater must make his way through this traffic to get to the Lake.

For the proposed marina there is direct access to the open Lake without the above mentioned obstacles. This will make the marina attractive to boaters presently docked on the Ashtabula River.

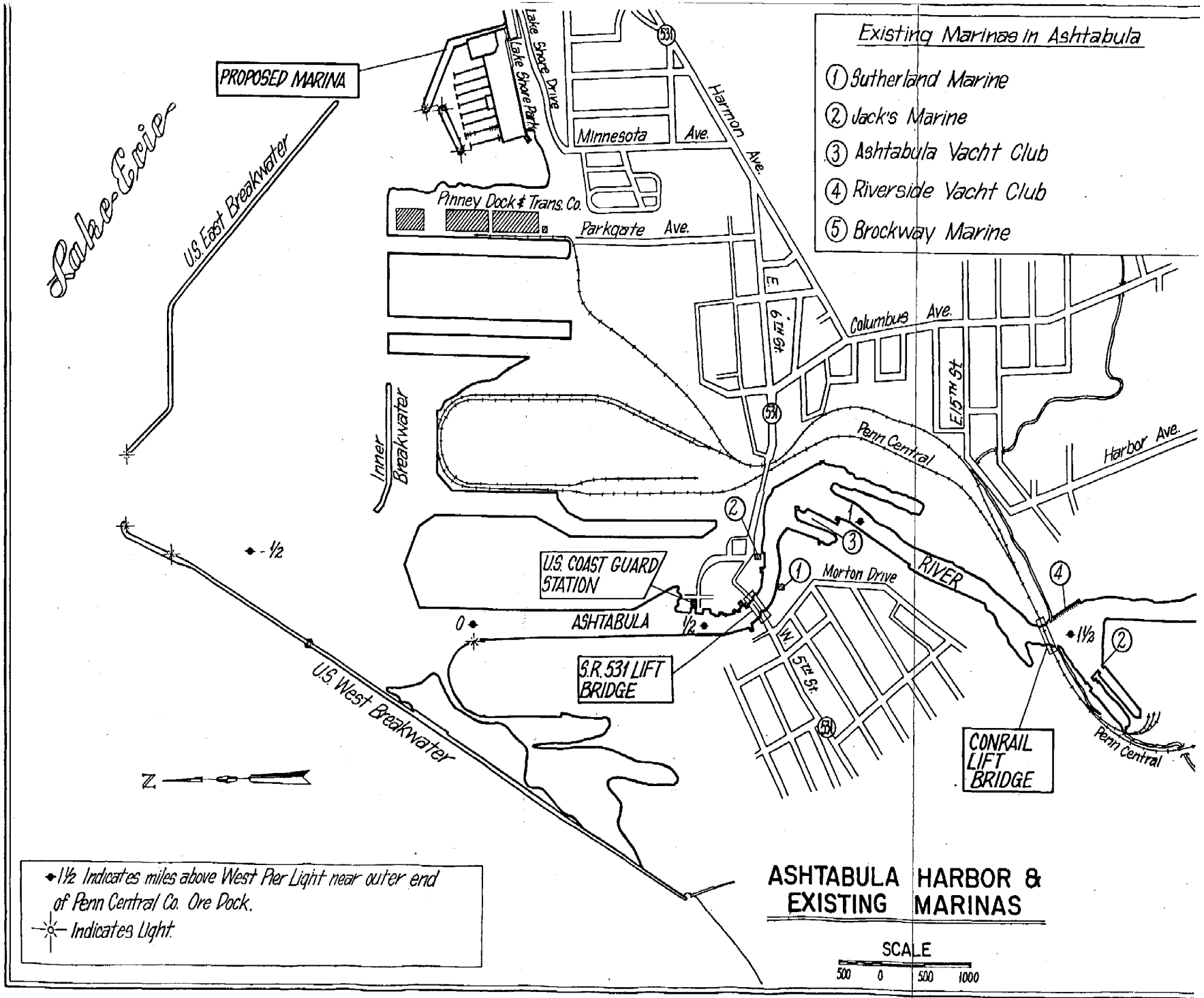

Existing Marinas in Ashtabula
1 Sutherland Marine
2 Jack's Marine
3 Ashtabula Yacht Club
4 Riverside Yacht Club
5 Brockway Marine
PROPOSED MARINA
Lake Erie
U.S. East Breakwater
Lake Shore Drive
Lake Shore Park
Minnesota Ave.
Harmon Ave.
Pinney Dock & Trans. Co.
Parkgate Ave.
E. 6TH St.
Columbus Ave.
E. 15TH St.
Inner Breakwater
Penn Central
Harbor Ave.
U.S. COAST GUARD STATION
Morton Drive
RIVER
ASHTABULA
S.R. 531 LIFT BRIDGE
W. 5TH St.
CONRAIL LIFT BRIDGE
U.S. West Breakwater
1/2
0
1 1/2
N
1½ Indicates miles above West Pier Light near outer end of Penn Central Co. Ore Dock.
Indicates Light
ASHTABULA HARBOR & EXISTING MARINAS
SCALE
500 0 500 1000

FIG. II-2

BOATING CONDITIONS

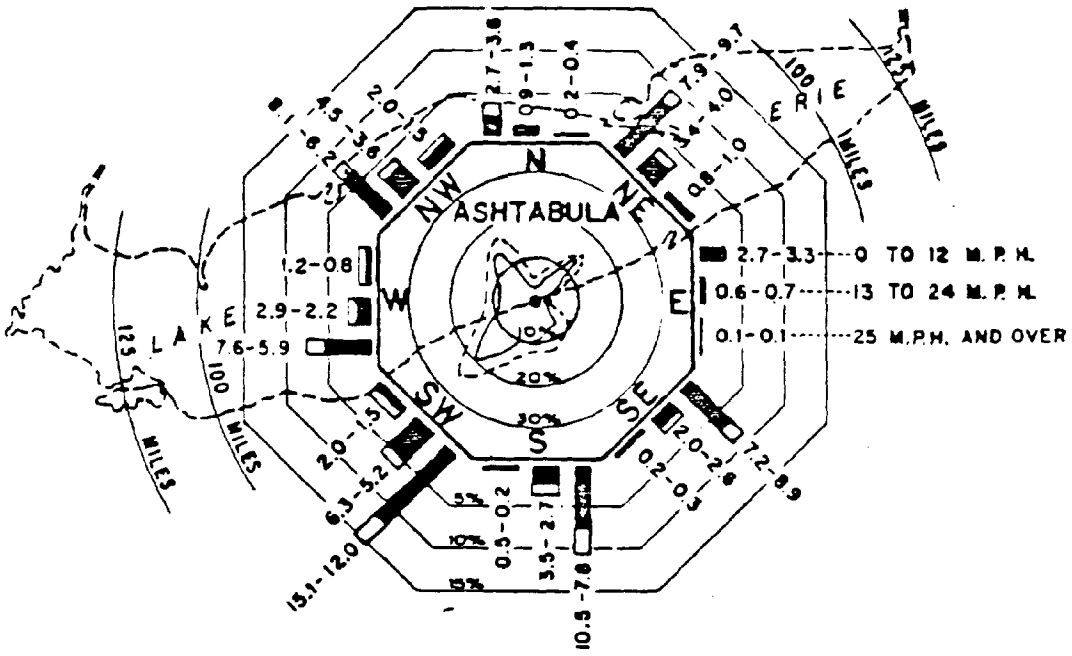
Lake Erie is well known for its ability to become dangerous in a storm due to its shallow depth. Quick and easy access in a marina on the Lake is a prime concern. The proposed marina would provide such access. The site is only exposed to open lake wave action from the North to Northeast. Northwest storms and wave action impact the Ashtabula Harbor breakwaters so that the site is somewhat protected in this direction. The breakwaters to be designed for the marina would protect it and allow 1 foot waves inside and are therefore one of the major cost items. It is desirable to have a minimum depth of 6 feet below Low Water Datum (LGLD) for the entire marina. With the present proposed alternates some dredging and excavation are required to achieve this minimum depth. Excavation is also another major expense.

Creating a safe harbor with sufficient depth will incur significant costs but should still prove to be technically and economically feasible.

SUMMARY

The proposed marina is an offshore facility. As such it involves obtaining a lease for submerged land and filling to make land. The site has excellent highway access for both local and regional traffic. Direct access to Lake Erie rather than using the Ashtabula River and passing through Ashtabula Harbor is a major advantage of this site. Breakwaters, dredging and excavation will be required for protection and safety of the boats in the marina.

It should be noted that the Snell Environmental Group performed a study entitled, Harbor Marina Master Plan Study - 1978 for the Ashtabula Port Authority. In the study, six sites were evaluated for a number of characteristics for suitability for a marina. Lake Shore Park was one of the sites evaluated and was rated the most suitable of the six for a marina.



WIND DIAGRAM FOR ASHTABULA, OHIO

NOTES

INDICATES DURATION FOR ICE-FREE PERIOD (MAR. TO DEC. INCL.) IN PERCENT OF TOTAL DURATION.

INDICATES DURATION FOR ICE PERIOD (JAN. TO FEB. INCL.) IN PERCENT OF TOTAL DURATION.

INDICATES PERCENT OF TOTAL WIND MOVEMENT OCCURRING DURING ICE-FREE PERIOD.

INDICATES PERCENT OF TOTAL WIND MOVEMENT OCCURRING DURING COMBINED ICE AND ICE-FREE PERIODS.

FIGURES AT ENDS OF BARS INDICATE PERCENT OF TOTAL WIND DURATION FOR ICE-FREE PERIOD AND COMBINED ICE-FREE AND ICE PERIODS, RESPECTIVELY.

WIND DATA BASED ON RECORDS OF THE U. S. COAST GUARD LIFE BOAT STATION AT ASHTABULA, OHIO FOR PERIOD 1 JAN. 1937 TO 31 DEC. 1968 INCL., LESS 1944, AND 1960.

FIGURE II-3

HISTORY OF LAKE SHORE PARK

The Ashtabula Township Park Commission purchased Lake Shore Park's land in 1910 for $15,000. In 1914, Volney Rogers, landscape architect, and Harry M. Rell, Civil Engineer of Youngstown, Ohio, laid out the roads and designed the park. The roads were completed in 1916. J.L. Wilson was employed as the Park Commission's architect in 1919 to design the Lake Shore Park main pavillion. The twenty-four foot by four hundred forty foot structure cost about $40,000. The pavillion still stands today as a historical landmark in Ashtabula County.

Since the time of these early capital improvements and park planning, many small changes in the park have taken place. The park, however, has remained the same in character as its original design.

DESCRIPTION OF ALTERNATES

The idea of a small boat marina in Lake Shore Park was proposed in the Lake Shore Park Recreation Plan. In that plan two designs, Alternate A and Alternate B, were presented. Although Alternate A was the recommended alternate in the Recreation Plan, a number of serious problems were found upon re-evaluating this design both in physical design and costs. The designs developed in this report are based primarily on Alternate B. Parking for marina users located elsewhere in the Park with shuttle service to the marina was proposed for Alternate B. Parking has been added within the marina site in this report's designs for convenience to users and to avoid the purchase of real estate upland of the Park. See Figure II-4 for the Alternate B layout.

FIGURE 4

LAKE SHORE PARK RECREATION

BOAT MARINA "B"

SCALE : 1" = 80'

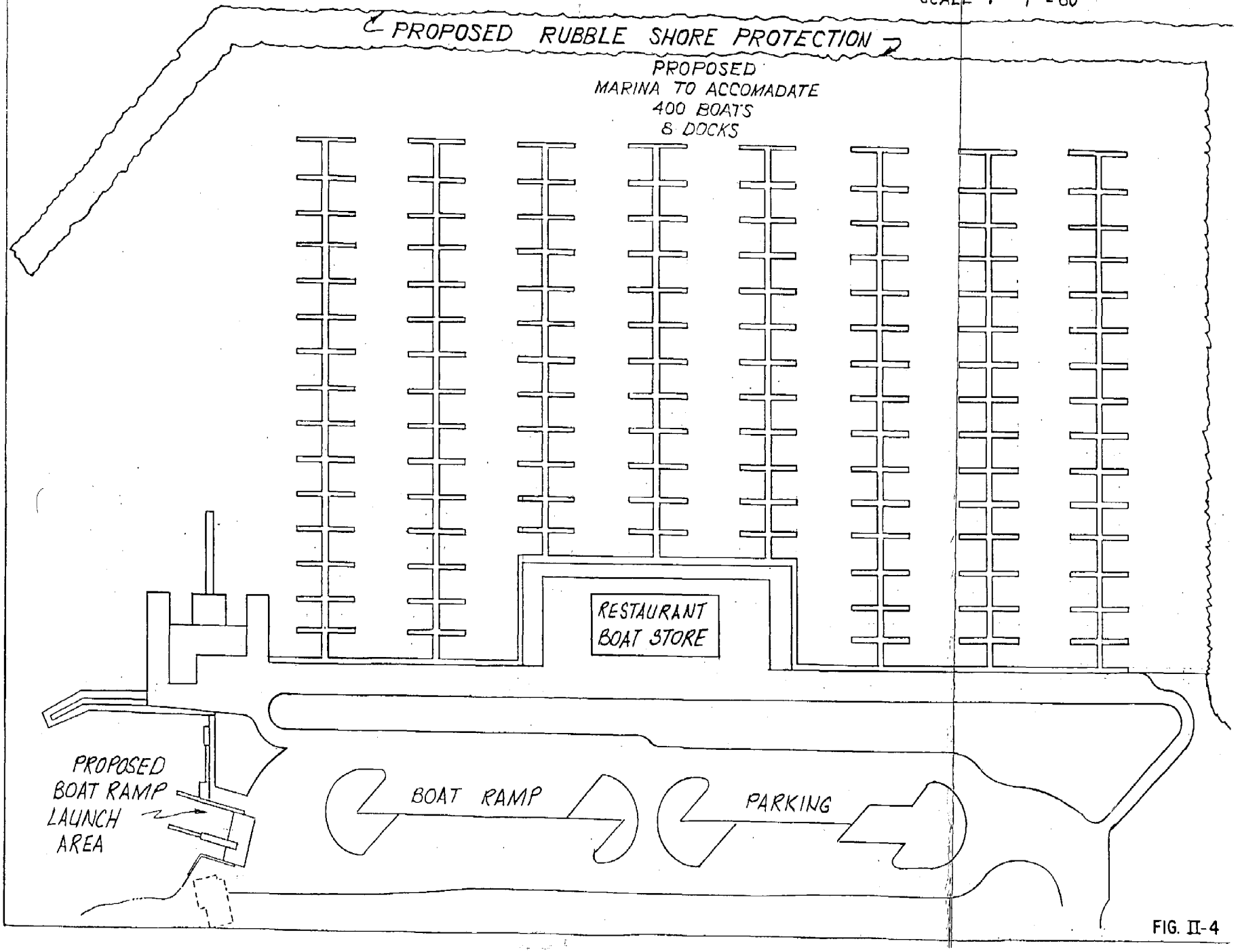


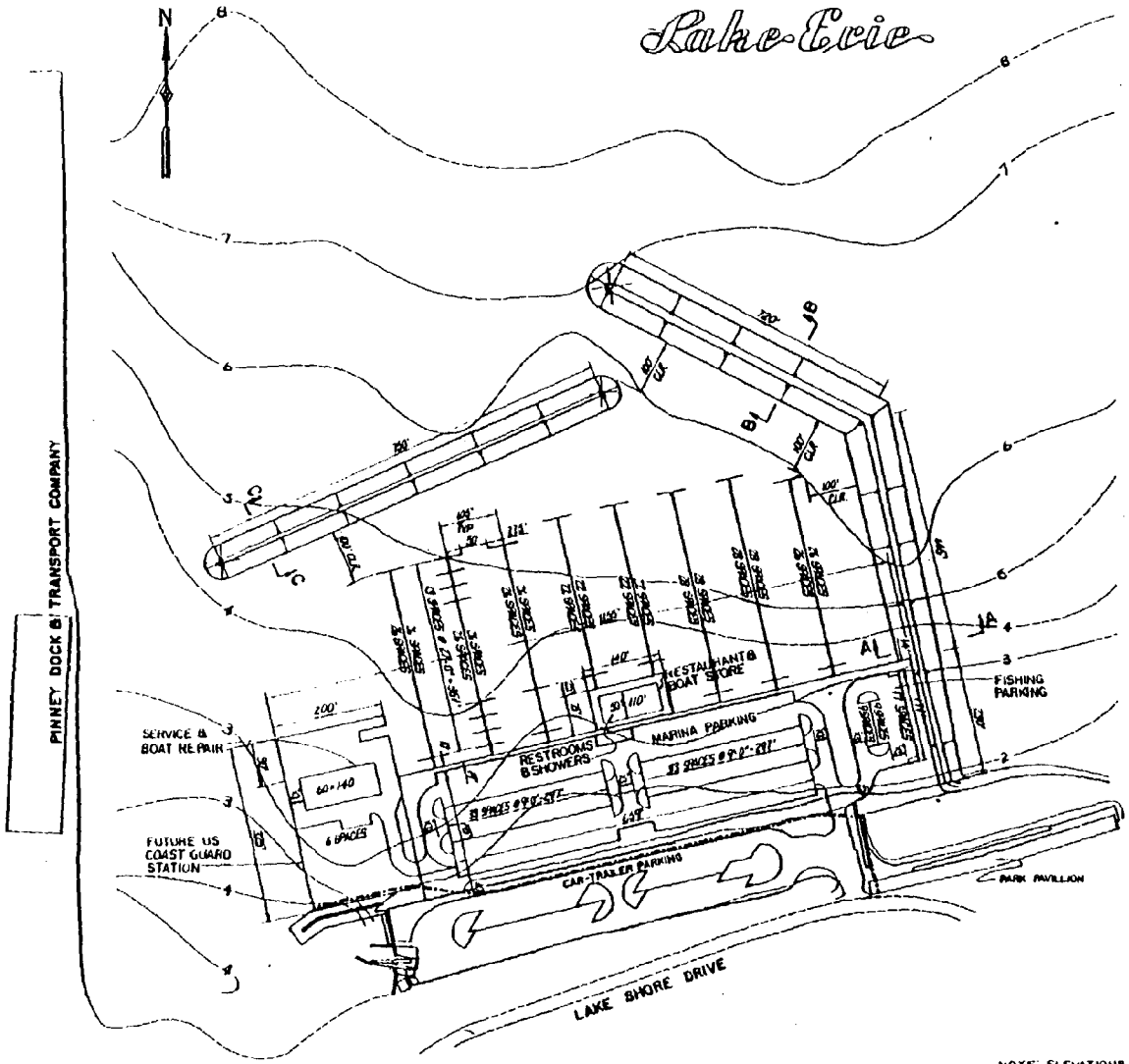
FIG. II-4

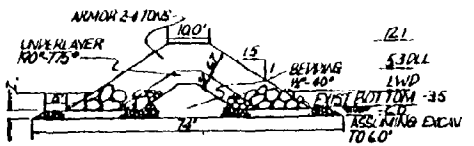
Five alternates are considered. The first four alternates, Alternate 1 through 4 consist of basically the same components arranged in different orientations or different areas. See the illustrations of the alternates in Appendix B. The fifth alternate is the "No Build" Alternate.

All the alternates use the boat ramp launching area driveway as the entrance point. A discussion of the features of the various Alternates follows.

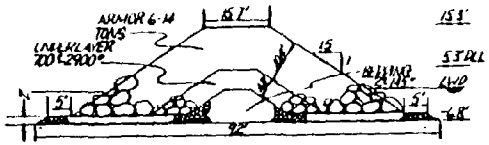
Alternate 1: Alternate 1 is developed parallel to the existing boat ramp parking lot. Made land for the marina parking extends about 225 feet out from the present land. The breakwater consists of two sections in a somewhat arrowhead shaped configuration. This puts the main channel into deeper water keeping excavation quantities smaller. It also provides two entrances to the marina, the second being on the far west side near Pinney docks. The existing sediment pattern indicates that there is little or no sediment in the main channel area presently. It can be expected that the silting problem should remain minimal in the future requiring less dredging and thus resulting in a cost savings.

The future U.S. Coast Guard Station is located on the west side of the marina. This is the shallowest portion of the harbor and therefore will involve more excavation to achieve the required depth of six feet below low water datum. This would be especially true if a variable draft is acceptable in the marina. Auto access to the Station would be through either the marina or boat ramp parking lots, an acceptable but not highly desirable situation on peak user days. This also incurs additional costs to the Park Commission since they are responsible for maintaining an access roadway to the Station throughout the winter. A two lane roadway would have to be kept plowed the length of one of the parking lots. The fact that the made land doesn't extend very far into the Lake,

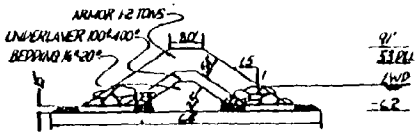




SECTION A-A



SECTION B-B



SECTION C-C

ALTERNATE 1 DATA	
NUMBER OF BERTHS	408
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/FISHING	35
CAR-TRAILER	
RESTAURANT AREA	2,000 S.F.
FACILITIES AREA	3,500 S.F.
MADE LAND AREA	6.7 AC.
BREAKWATER LENGTH	2,143 FT.
BULKHEAD LENGTH	1,860 FT.
VOLUME OF FILL	88,100 C.Y.
PAVEMENT AREA	18,140 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$ 6,557,400

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM LOW WATER DATUM *568.6 IGLD, 570.3 USGS

NOTE: AREA SOUTH OF [illegible] LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE 1

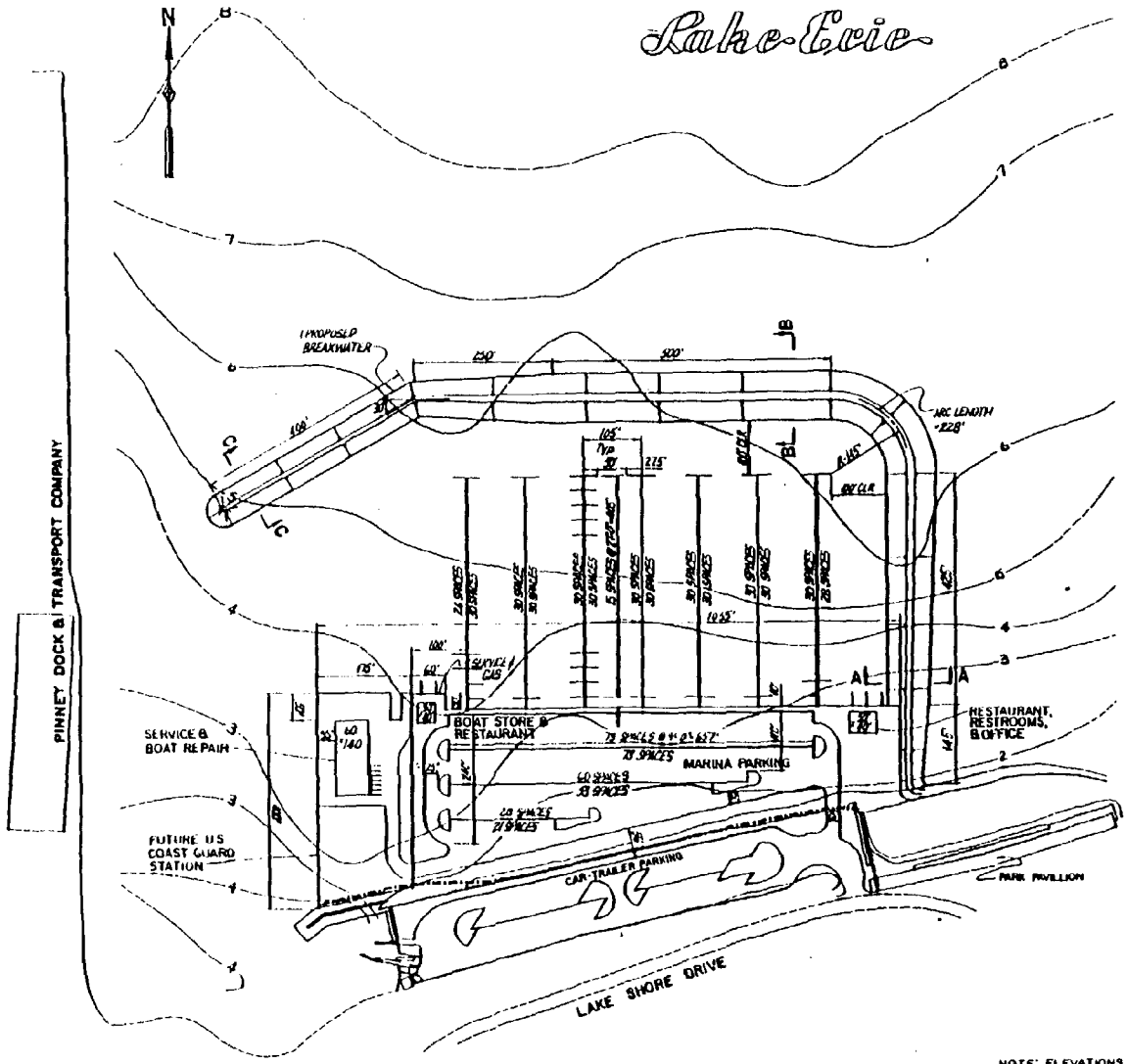
FIG II-5

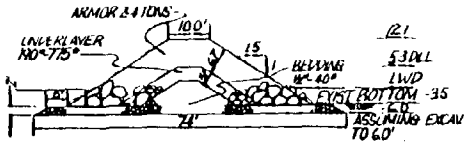
increases the amount of excavation needed to obtain the required harbor depth. Since the possibility of a Coast Guard move is at least seven years in the future, the construction of a warehouse type building is proposed in this location at present. It would be leased to a boat repair and service outfit until the Coast Guard is prepared to move.

Alternate 1 provides 408 slips arranged in eight lines. Parking is provided for 396 cars for the marina and for 35 cars for fishing. The fishing parking is located on the east side of the site near the east breakwater. This breakwater is the site of the new fishing access provided. No additional car-trailer parking is provided for the boat ramps in this design. One centrally located marina building is the source of many of the services provided. This building would contain a restaurant, a boat store, the marina office, men's and women's showers and restrooms and an area for the gasoline attendant. Although it could cause some traffic problems, it is convenient and easy to have everything in one central location.

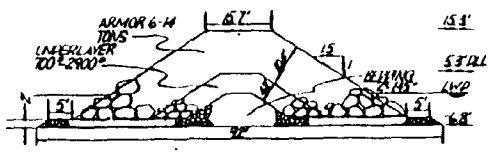
Alternate 2: Alternate 2 is oriented in a north-south direction. This results in the made land area being nearly triangular in shape, the base, 400' long, being on the west side of the site. The breakwater is continuous around the east and north sides of the harbor. The result is a single entrance channel on the west side of the site. This is the shallower portion of the harbor so that considerable excavation will be required. What sediment there is on the site is located in this area. Since this is where silting occurs at present it would be expected to continue in the future, incurring significant annual dredging costs to maintain entrance channel depths. The continuous breakwater allows minimal water flow through the marina possibly causing a stagnancy problem.

The Coast Guard is located on the west side of the site in this

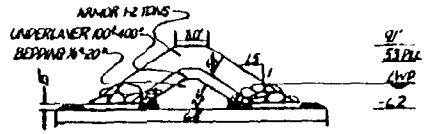




SECTION A-A



SECTION B-B



SECTION C-C

ALTERNATE 2 DATA	
NUMBER OF BERTHS	414
NUMBER OF PARKING SPACES:-	
MARINA	381
RESTAURANT/FISHING	
CAR-TRAILER	
RESTAURANT AREA	1,500 S.F.
FACILITIES AREA	1,700 S.F.
MADE LAND AREA	67 AC.
BREAKWATER LENGTH	1,950 FT.
BULKHEAD LENGTH	1,640 FT.
VOLUME OF FILL	85,700 C.Y.
PAVEMENT AREA	16,940 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$ 6,243,700

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF ·—·—· LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

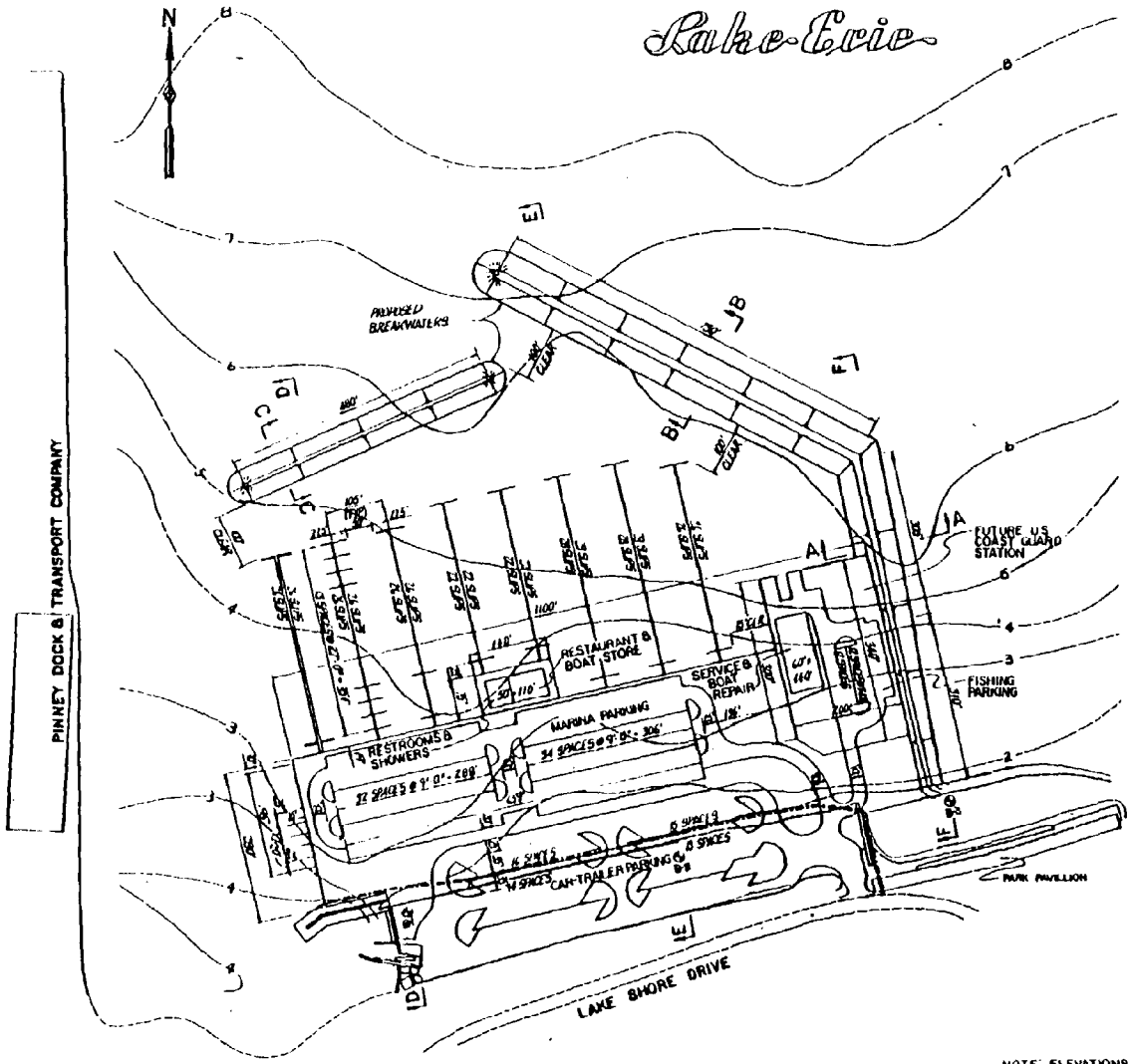
ALTERNATE 2

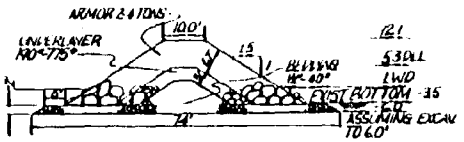
Fig. II-6

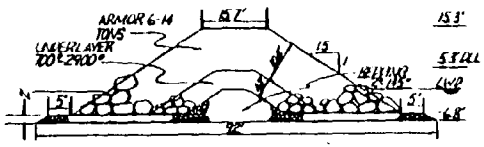
layout. All the items mentioned for this location in Alternate 1 apply here also. Housing a boat repair and service facility in this area is the present proposed use. The parking arrangement may make auto access a little more difficult than Alternate 1. The depth at the border of the made land is about four feet below low water datum, requiring considerable excavation and dredging.

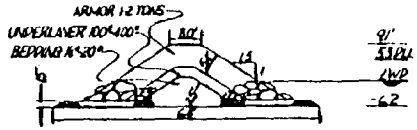
414 berths are provided in seven lines. A person owning a slip on the east side of the marina must travel the entire length of the harbor to get onto the Lake. Parking is provided for 381 cars for the marina. The arrangement of spaces is oriented east-west resulting in differing lengths of lines of cars since the lot is triangular in shape. No separate parking space is provided for fishing so that fishermen would have to pay to park in the marina lot. No additional car-trailer parking is included for the boat ramps in this layout. Two separate smaller buildings are proposed in addition to the boat repair building. A building housing a boat store and the gasoline facilities is located on the west side of the marina parking lot. This is a logical location for the gas station since the boats must pass by to get out of the marina. The restaurant, marina office and shower and restroom facilities are in a building on the east side of the site. The east side of the parking lot could be under considerable demand on peak days between marina users, fishermen, and restaurant clientele.

Alternate 3: Alternate 3 is oriented parallel to the existing boat ramp parking lot. Made land for the marina parking lot extends 300 feet into the Lake from the present land. The breakwater layout is in two sections similar to that in Alternate 1. Due to the parking lot extending further the main channel is in deeper water than for the first Alternate, an additional advantage. All comments regarding marine access and siltation problems for number 1









ALTERNATE 3 DATA	
NUMBER OF BERTHS	408
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/ FISHING	40
CAR-TRAILER	58
RESTAURANT AREA	2,000 S.F.
FACILITIES AREA	3,500 S.F.
MADE LAND AREA	7.9 AC.
BREAKWATER LENGTH	1,825 FT.
BULKHEAD LENGTH	1,940 FT.
VOLUME OF FILL	104,000 C.Y.
PAVEMENT AREA	22,560 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$6,233,200

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF [illegible] BY OTHERS

100 0 100 200 300 400
SCALE IN FEET

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE 3

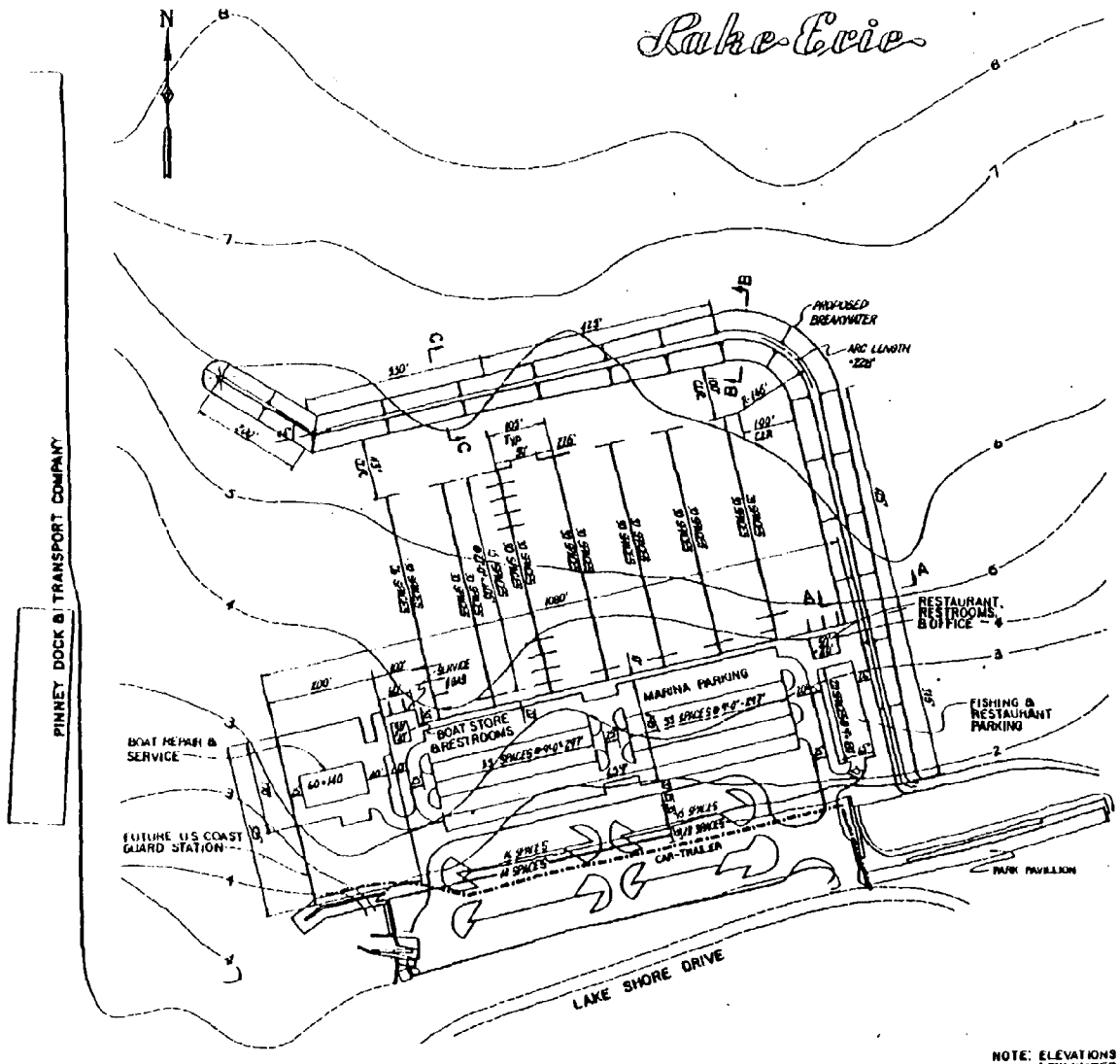
FIG. II-7

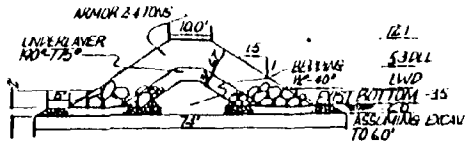
are equally applicable here.

The future Coast Guard Station is located on the east side of the site near the main entrance. A short, separate roadway is provided for auto access. Both from the standpoint of public interference and maintaining winter access this location is superior to the west side of the marina. The eastern portion of the harbor is deeper so that less excavation will be required to obtain the six foot below low water datum depth needed. A boat repair and service facility is proposed as the present use for the future Coast Guard Station. Although extending further into the Lake requires making more land, it results in less underwater excavation to achieve minimum depths.

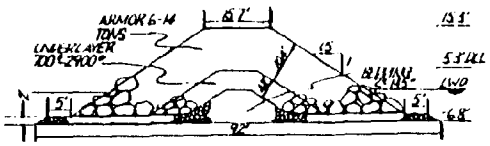
The arrangement of slips and marina parking for Alternate 3 are similar to that for alternate 1. 408 slips are provided along with 396 marina parking spaces. Parking spaces for 40 cars for fishing access is proposed and additional present use of the future Coast Guard area. The car-trailer parking for the boat launch ramp is expanded to accommodate an additional 58 vehicles. This brings the number of parking spaces closer to the capacity of the three lane boat ramp providing full use of an existing facility. The single, central marina building housing a restaurant, boat store, marina office, and shower and restroom facilities is included in the layout.

Alternate 4: Alternate 4 is developed parallel to the existing boat ramp parking lot. Made land for the marina parking lot extends approximately 300 feet out from the present land. The breakwater is a continuous "L" shape similar to that for Alternate 2. The single entrance is on the west side of the site. All comments concerning siltation and achieving minimum depths for number 2 also apply here. The situation is a little better since the extended parking lot puts the main channel in slightly deeper water. The Coast Guard Station is sited at the west end of the marina parking lot. The comments made in the Alternate 1 discussion apply here as to siltation, required depths, and auto

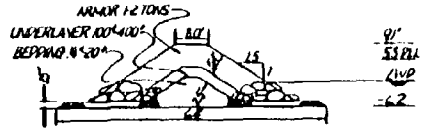




SECTION A-A



SECTION B-B



SECTION C-C

ALTERNATE 4 DATA	
NUMBER OF BERTHS	414
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/FISHING.	40
CAR-TRAILER	58
RESTAURANT AREA	1,600 S.F.
FACILITIES AREA	1,700 S.F.
MADE LAND AREA	7.2 AC.
BREAKWATER LENGTH	1,928 FT.
BULKHEAD LENGTH	1,755 FT.
VOLUME OF FILL	98,100 C.Y.
PAVEMENT AREA	23,380 S.Y.
ESTIMATED CONSTRUCTION-	
COST 1979	$ 5,715,300

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM +568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF [illegible] LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE 4

FIG. II-8

access. With the marina entrance on the west, it provides quick and easy access onto the Lake for the Coast Guard. Here again a boat repair and service facility is proposed for present use of the area. The extension of the made land to accommodate additional parking increases the amount of fill required but decreases the quantities of excavation and dredging due to the greater natural depth.

The slip arrangement for this Alternate is similar to that for Alternate 2 providing 414 slips in seven lines. The marina parking lot provides spaces for 396 cars. A small parking lot with a 40-car capacity is located on the east side of the site. This lot will be used by fishermen and by restaurant clientele. As in Alternate 3, 58 additional car-trailer parking spaces are included to bring the boat ramp up to full usage. Two separate buildings are proposed. The one on the east side would contain the marina offices, a restaurant and shower and restroom facilities. The other on the west would include a boat store, gas pumps, and restrooms.

Comparison of Alternates: The features, and some advantages and disadvantages have been discussed in the previous descriptions. Pertinent construction quantities are listed on the site plans and in the cost estimates. Cost estimates are developed in another portion of this report.

Alternate 4 is the least expensive of the first four alternates with regard to construction cost. Its main cost savings compared to Alternates 1 and 2 is in excavation and dredging costs to obtain minimum harbor depths. The smaller quantities of these two items must outweigh the expense of making additional land. This also is true for Alternate 3 as compared to the first two Alternates. In addition, both Alternates 3 and 4 provide additional car-trailer parking for the boat ramp. This will bring the ramp closer to capacity and therefore represent better utilization of Park facilities. Since all of the

features in Alternates 1 and 2 are included in either Alternate 3 or Alternate 4 and the latter are less expensive in addition to providing this extra parking, Alternates 1 and 2 are not recommended.

The major differences between Alternates 3 and 4 lie in two areas: the breakwater arrangement and the location of the future Coast Guard Station.

A number of points concerning the two breakwater arrangements were discussed in the previous descriptions. The "L" shaped continuous layout in Alternate 4 affords very good protection. It puts the single entrance channel toward the shallower portion of the site where siltation occurs. Annual dredging will definitely be required to keep the marina in operation. It may be a large, costly operation. Inconvenience to boaters docked on the east side of the marina was also mentioned. The arrow arrangement of Alternate 3 provides two entrances, decreasing the chance of traffic bottlenecks. The main entrance channel is deeper therefore requiring less excavation to attain minimum depths. There is very little sediment around the main entrance so that siltation should be minimal in the future. Dredging costs would certainly be less for this arrangement.

The other consideration is the future Coast Guard Station. Location on the west side of the marina as in Alternate 4 has drawbacks which were cited previously. The expense to the Park in maintaining auto access throughout the winter would be considerable. The location on the east side of the site provided in Alternate 3 has the advantages discussed in the descriptions and minimizes costs to maintain winter access.

The other alternate is "No Build". Although no money would be expended, none of the stated goals would be achieved. For the above reasons the recommended alternate is Alternate 3.

SERVICES TO BE OFFERED IN THE MARINA

In some of the studies cited concerning marinas, surveys were done to determine what type of services boaters wanted in marinas. These were used as a basis to decide which services are to be provided in Lake Shore Park Marina to make it attractive to the boating public. The following services are provided.

Walkways and finger piers are the floating type to eliminate inconvenience in boarding due to Lake level variation. Water and electrical service are provided to each berth and the main walkways will be lighted. Haul-out facilities are included and two haul-outs per year are included in the slip rental fee. A marine fuel station is provided since it would mean a trip into Ashtabula Harbor otherwise to obtain fuel. A sewage pump-out facility is located near the gas station for those boats with holding tanks. The slip rental fee also includes winter storage at the marina. Boats will be stored on wooden cradles on the marina and boat ramp area parking lots and other open areas in the marina site. Security parking is provided for the marina and yearly parking permits are available to slip owners. Restroom and shower facilities are included. A boat store is a great convenience to boat owners who discover they need something for the boat and they are already at the marina. Finally, a restaurant is included not only to serve the slip owners but also other Park users and the public in general.

FINANCIAL FEASIBILITY

Economic Environment

The market areas chosen for this demand analysis took a number of factors into consideration, such as travel time, highway access, similar facilities, and so on. Upon investigation, it was found that population, business and industry are all experiencing moderate growth and this can be expected to continue or improve in the future. This kind of growth indicates an increasing number of potential boat owners and marina users.

Competitive Environment

A listing of the marinas on Lake Erie within the total market area is given in Table A-6. There is a total of approximately 5,900 existing dock spaces within the area. Of the four Lake Erie counties in the market area, Ashtabula County has the fewest slips presently so that it is an appropriate location for adding new dock spaces. A number of marina studies have found occupancy rates exceeding 95% in the marinas on Lake Erie. These studies also inventoried the services available at the marinas. Some of the older marinas lack one or more services such as running water or electrical service for each berth. All the modern conveniences for boating are included in Lake Shore Park Marina to make it competive and attractive to the boating public.

A new 360-slip marina is planned for Geneva State Park in Geneva-on-the- Lake, Ohio. The park is located in western Ashtabula County, about 12 miles from Lake Shore Park. This proposed marina is taken into account in the demand analysis performed for this project.

TABLE A-6

COMPETITIVE MARINAS - 1979

ASHTABULA COUNTY

NAME	NUMBER OF SLIPS
City of Conneaut	150
Conneaut Boat Club	58
Snug Harbor Marina	20
Sutherland Marina	25
Ashtabula Yacht Club, Inc.	110
Jack's Marine	200
Riverside Yacht Club, Inc.	30
Redbrook Boat Club	150
Brockway Marine	30
Total	773

LAKE COUNTY

NAME	NUMBER OF SLIPS
Encounter Yacht Sailing Center	30
Winfield Marine	15
Douglass & McCleod	20
Rutherfords Landing	50
Grand River Yacht Club	*
Fairport Yacht Club	135
Grand Harbor Hacht Sales	132
Western Reserve Yacht Club	50
Mentor's Lagoon Marina	650
Mentor Harbor Yacht Club	160
Chagrin Harbor Beach Marina	23
Chagrin Lagoons Yacht Club	150
West Channel Yacht Club	70
Hi-Skipper Marina	80
Lake Shore Marina	85
Chagrin River Yacht Club	*
Bolten Marine Sales, Inc.	165
M-K	32
Total	1,847

* Information not available.

TABLE A-6 (Continued)

COMPETITIVE MARINAS - 1979

CUYAHOGA COUNTY (EASTERN HALF)

NAME	NUMBER OF SLIPS
Wildwood Yacht Club, Inc.	60
Northeast Yacht Club	180
East 55th Street Marina	292
Gordon Shore Boat Club	*
Forest City Yacht Club	135
Lakeside Yacht Club	200
Edgewater Park Marina	306
Edgewater Yacht Club	375
Cuyahoga Boat & Engine Co., Inc.	85
Total	1,633

ERIE COUNTY, PENNSYLVANIA

NAME	NUMBER OF SLIPS
Freeport Yacht Club	—
Presque Isle Lagoon Boat Livery	55
Bayshore Marine	13
Lund Boat Works, Inc.	—
R.D. McAllister & Son, Ltd.	95
Brockway Marine Erie, Inc.	75
East & West Canal Basin	33
Gem City Marina	35
Sailyard	24
Presque Isle Yacht Club	89
Erie Marine	46
Chestnut Street Marina	62
Polish Yacht Club	*
Commodore Perry Yacht Club	78
Presque Isle State Park	498
Furncliff Beach Association	6
Erie Yacht Club	360
Sommerheim Moorings	—
Walnut Creek	75
Total	1,544

* Information not available.

Source: Boating Facilities Inventory for Lakes Erie and Ontario and Connecting Waterways, U.S. Army Corps of Engineers, Buffalo District, Buffalo, N.Y. 14207, December 18, 1979.

FINANCIAL FEASIBILITY (CONTINUED)

Demand Analysis

In recent years, a number of feasibility studies have been done for marinas in Ashtabula County. All of these agree in stating that demand for additional dock spaces exists in this area. An analysis of boating statistics for Ohio results in a figure of 3½ boats indicating a preference for Lake Erie waters per existing dock space in 1977. (See Appendix A.) This indicates considerable boater pressure along the Ohio shore of Lake Erie. It is to be noted that the number of slips in Ashtabula County has grown 260% from 1965 to 1979 without any problems with excessive vacancies.

The results of the analysis performed in Appendix A indicate demand for 3,270 dock spaces in the primary market area. When the demand is proportioned to the two Lake Erie counties within the primary market area, an additional 670 dock spaces are needed in Ashtabula County. Despite the fact that this number is less that the combined total of new spaces provided by the Geneva-on-the-Lake Small Boat Harbor and this project, with as little as 3% growth in boating, both marinas can expect to be full within less than three years.

Financial Feasibility

The financial analysis for this project involves the determination of the Park Commission's ability to repay the construction loan from revenues generated by the marina. Table A-9 develops the total project costs for Alternate 3, the recommended alternate. The $8.4 million total is the amount of the loan required for design and construction of the project.

TABLE A-9

PROJECT COST FOR ALTERNATE 3

Administrative Cost		
CEIP (d)(1) loan and guarantee		$32,700
Architectural fees		
Estimate from 6/80	$389,000	
+1 year delay @ 10%	$ 38,900	
	$427,900	
-308 (c)(1) grant	$-16,000	
	$411,900	$411,900
Construction cost		
Estimate from 6/80	$6,233,000	
+15% for 1.5 year delay	$ 935,000	
	$7,168,000	$7,168,000
		$7,612,600
Required Contingency factor (10%)		$ 761,300
Total Project Cost		$8,373,900
Annual Payment for 5% Interest & 30 year term		$ 544,700

FINANCIAL FEASIBILITY (CONTINUED)

Financial Feasibility

The annual operating costs and yearly revenues are examined for the first, fourth, and fifteenth years of operation in Table A-10. It is expected that the marina will be fully occupied by the fouth year and the fifteenth year is the median year for a thirty year loan. Revenues include seasonal slip rental fees, rents from leases for a boat store and a restaurant, parking fee, and fuel sales. Operating costs include payroll, administrative and general costs, energy costs, repairs and maintenance and insurance. The difference between yearly revenues and annual operating cost is the amount available to repay the loan. The $546,00 available in the fifteenth year exceeds the annual payment of $545,000 required for a thirty year loan with 5% interest for $8.4 million. Some type of arrangement allowing graduated payments will have to be worked out so that the Park Commission can repay the loan in accordance with the revenues available.

TABLE A-10

ANNUAL REVENUES AND COSTS

1982, 1986, 1997

	1982	1986	1997
Occupancy	86%	100%	100%
Revenue			
1) Slip rental			
Season	217,500	330,500	695,000
Transient	2,200	2,900	6,400
2) Building leases			
Boat store & restaurant	48,000	48,000	120,000
3) Parking Fees			
Season permit	8,700	11,300	26,300
General-day	3,600	5,400	10,800
	$280,000	$398,100	$858,500
4) Fuel sales	8,400	9,700	15,000
	$288,400	$407,800	$873,500
OPERATING EXPENSES			
1) Payroll & related expenses	$62,400	$81,100	$171,600
2) Administrative & general	8,400	11,900	25,800
3) Energy costs	14,000	19,900	42,900
4) Repairs & maintenance	5,600	8,000	17,200
5) Property insurance	30,000	35,000	60,000
6) Reserve for replacement	5,000	5,000	10,000
	$125,400	$160,900	$327,500
Amount available for loan payment	$163,000	$246,900	$546,000

SECTION III

PROJECT ANALYSIS

LIFE CYCLE ANALYSIS

The breakwater design made use of rubblemound construction because of its economy and durability. The design criteria used will insure the breakwater's longevity. Other materials used in construction will be specified in the final design so as to provide durability for the project life.

DESIGN AND CONSTRUCTION SCHEDULE

The following schedule of activities is anticipated:

	Months After Award
1. Preparation of final design	9
2. Final plans and specifications	11
3. Construction bids solicited	11
4. Construction contract finalized	13
5. Construction period	30
6. Initial operation of marina	31

REAL ESTATE

Since the marina is an offshore facility, a lease for the required area must be obtained from the State of Ohio, which owns the lake bottom land. No problems are anticipated in obtaining this lease. All utilities are accessible within Lake Shore Park and since the Township Park Commission are the applicants for this loan no easements from other interests will be needed. See Exhibit III-1, a copy of a certificate of title for Lake Shore Park.

OFFICE OF
THE PROSECUTING ATTORNEY
ASHTABULA COUNTY COURTHOUSE
JEFFERSON, OHIO 44047

JOHN G. CARDINAL
PROSECUTING ATTORNEY

PHONE:
216-576-2040
EXT. 251 & 253

January 17, 1980

Ohio Department of Energy
30 East Broad Street
34th Floor
Columbus, Ohio 43215

Attn: Ohio CEIP Coordinator

Gentlemen:

I have examined the records of Ashtabula County, Ohio, in reference to premises certified by Hugh L. Thomas, Assistant Director, on April 16, 1979 and described as follows:

> "Situated in the City and Township of Ashtabula, County of Ashtabula, and State of Ohio, known as being part of sections, numbers two (2) and three (3) in township number thirteen (13) range three (3) Connecticut Western Reserve. Commencing in the west line of Minnesota Street in the Harmon Park Plat at a point where the centerline of Park Avenue intersects the same. Thence easterly along the centerline of said Park Avenue about ten hundred fifty (1050) feet to a stone at a point where the centerline of Manola Street will intersect the centerline of said Park Avenue; thence southerly along the centerline of Manola Street about ten hundred eighty-seven (1087) feet to the center of the Lake Road so called. Thence easterly along the center of the Lake Road to the west line of lands now or formerly owned by Sheldon Harmon, which point is supposed to be at the intersection of the east line of the East Village Road with the centerline of said Lake Road. Thence northerly

along the westerly line of the lands of said Harmon about ten hundred forty-nine (1049) feet to the waters of Lake Erie. Thence westerly along the waters of Lake Erie about twenty-five hundred forty-two and fourteen hundredths (2542.14) feet to a point, which point would be in the northerly extension of the west line of University Street. Thence southerly on the line which would be the northerly extension of the west line of Minnesota Street to the place of beginning, excepting and reserving however from the above described premises lots numbers one hundred eighty (180), one hundred ninety-four (194), one hundred ninety-five (195) and one hundred ninety-six (196) in said Harmon Park Plat heretofore sold and conveyed.

I find title to be good in the Ashtabula Township Park Board, subject only to the following liens and encumbrances as of December 31, 1979, at 10:00 a.m.

1.) zoning regulations imposed by the Council of the City of Ashtabula, Ohio, and the Board of Township Trustees of Ashtabula Township, Ashtabula County, Ohio

Very truly yours,

JOHN G. CARDINAL
PROSECUTING ATTORNEY

BY Edward G Ptaszek
EDWARD G. PTASZEK
Assistant Prosecutor

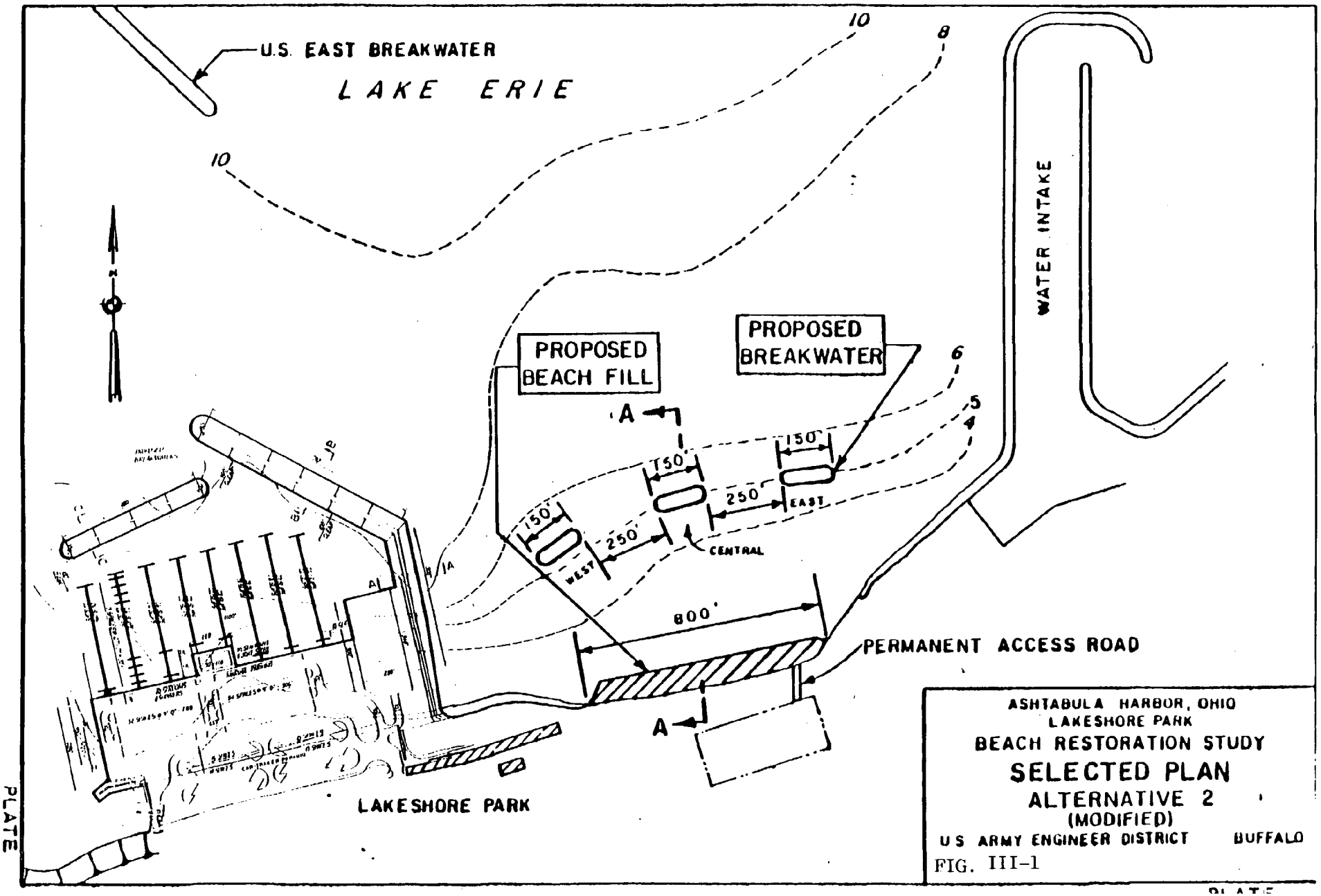
EGP/wa

ENVIROMENTAL ASSESSMENT INFORMATION

Other Federal Agency Involvement

An application for a 404 permit has been filed with the U.S. Army Corps of Engineers, Buffalo District. This is necessary since the marina construction involves placing structures and fill materials into the waters of Lake Erie. The Corps of Engineers has done a number of studies in relation to their proposed Beach Erosion and Shoreline Protection Project for Lake Shore Park. Among these are: Section 103 Shore Erosion Report, Section 111 Ashtabula Harbor Report and the Lake Shore Park Beach Erosion and Shoreline Protection Study. Included as Appendix D is the Preliminary Section 404 (b) Evaluation for the Beach Erosion and Shoreline Protection Project which contains information applicable to the marina as well since the beach project is immediately to the east of the proposed marina. See Figure III -1

In the preparation of this preliminary Engineering Report other agencies have been consulted on various subjects. Since the possibility of moving the U.S. Coast Guard's Ashtabula Station into the marina exists, a number of meetings were held with representatives of the 9th District Staff. Input as to physical requirements for a station and the time frame involved in such a move were obtained as well as review of the various alternates proposes. Included as Exhibit III-2 is a letter from Captain E.H. Daniels, U.S. Coast Guard, outlining their position on a possible move at the present time. A meeting was held in Columbus, Ohio with members of the staff of the Ohio Department of Natural Resources to make them aware of the proposed marina project. They are involved in the funding of the Lake Shore Park Boat Ramp Project, which is immediately south of the proposed marina. Car-trailer parking expansion for this boat ramp is part of two of the alternates for the marina. The Port Authority of the City of Ashtabula has been informed of the plans for a marina in Lake Shore Park;


U.S. EAST BREAKWATER
LAKE ERIE
10
10
8
6
5
WATER INTAKE
PROPOSED BEACH FILL
PROPOSED BREAKWATER
A
A
150'
150'
150'
250'
250'
EAST
CENTRAL
WEST
800'
PERMANENT ACCESS ROAD
LAKESHORE PARK
ASHTABULA HARBOR, OHIO
LAKESHORE PARK
BEACH RESTORATION STUDY
SELECTED PLAN
ALTERNATIVE 2
(MODIFIED)
U S ARMY ENGINEER DISTRICT BUFFALO
FIG. III-1

PLATE

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

Address reply to:
COMMANDER (dpl)
Ninth Coast Guard District
1240 East 9th St.
Cleveland, Ohio 44199
Phone: (216) 522-3293

25 NOV 1980

Mr. Albert Malinak
Woodruff Engineering Inc.
23875 Commerce Park Road
Beachwood, OH 44122

Dear Mr. Malinak:

For some time now, your firm has been working with The Ashtabula Township Park Commission and County Planning Commission on the Lakeshore Park Recreation Plan. The present plan does affect the Coast Guard by including a proposed new site for our Station in Ashtabula.

As Commander Peterson of my staff has mentioned to you, the relocation of our station is a very indefinite matter. Although we do have some very real problems with our present site, relocation is only one of several available alternatives. The proposed site in your Recreation Plan is certainly attractive for a potential Coast Guard Station, but it is not possible to determine at this time if such a site will actually be needed.

We do appreciate being included in your marina development plans, and sincerely hope that the option of relocation will remain open for us.

Sincerely,

E. H. Daniels
Captain, U.S. Coast Guard
Chief of Staff
Ninth Coast Guard District

although it is out of their jurisdiction. A copy of a resolution from the Port Authority expressing their support for the Lake Shore Park Marina is included, see Exhibit III-3.

Description of Proposed Project

The description of the marina project along with discussions of construction methods and time frame estimates are given in corresponding sections of the PER.

Description of the Surrounding Environment

See the Site Description portion of the Project Description section of this report for a discussion of the surrounding environment.

The U.S. Fish and Wildlife Service informed the Corps of Engineers of a water fowl area south of the East Breakwater of Ashtabula Harbor in relation to the Beach Erosion Study. This area is indicated in Figure III-2 and it can be seen that the marina will not intrude into this area. The marina should, in fact, reduce pleasure craft traffic through this area since it will provide direct access to the open Lake. An aerial photograph of Lake Shore Park is included, see Appendix B.

Temporary Impacts of the Proposed Project

It should be mentioned that simultaneous construction of the proposed marina and the proposed reconstruction of the beach immediately to the east by the Corps of Engineers would be beneficial. Such coordination of construction activities would minimize the duration of temporary impacts caused by construction and minimize the inconveniences to park users.

Air Quality: It would be expected that there would be minor increases in fumes and dust levels due to the heavy machinery used during construction. These increases should not be significant due to the normal levels generated by coal and iron ore handling facilities and the power generating facilities in the area as well as normal park maintenance equipment and automobile traffic.

Water Quality: An increase in turbity will accompany construction activities. All efforts necessary will be taken in order to minimize both the amount

A SHTABU' \ PORT AU. HORITY \
Port Of Progress
P.O. BOX 889
ASHTABULA, OHIO 44004

NOVEMBER 3, 1980

A RESOLUTION

WHEREAS; THE ASHTABULA PORT AUTHORITY MET ON NOVEMBER 3,1980 AND DISCUSSED THE PROPOSED MARINA AT LAKE SHORE PARK,and,

WHEREAS; THE ASHTABULA PORT AUTHORITY IS TOTALLY COMMITTED TO THE BETTERMENT OF THE SHORELINE OF LAKE ERIE IN ASHTABULA COUNTY, and,

WHEREAS; IT IS DETERMINED THAT THIS IMPROVEMENT WILL GREATLY BENEFIT ALL THE CITIZENS OF ASHTABULA COUNTY AND IN PARTICULAR THE CITIZENS OF ASHTABULA CITY.

THEREFORE, BE IT RESOLVED THAT THE ASHTABULA PORT AUTHORITY HEREBY UNANIMOUSLY ENDORSES AND SUPPORTS THIS VENTURE AND PLEDGES FULL COOPERATION TO THE ASHTABULA TOWNSHIP PARK BOARD IN THIS ENDEAVOR.

Harold T Leehan
HAROLD LEEHAN, CHAIRMAN

Armando Santilli
ARMANDO SANTILLI

William Herzog
WILLIAM HERZOG, SECRETARY

Joseph Lovas
JOSEPH LOVAS

Carmen Corbissero
CARMEN CORBISSERO

ALEX PATTERSON

Exhibit III-3

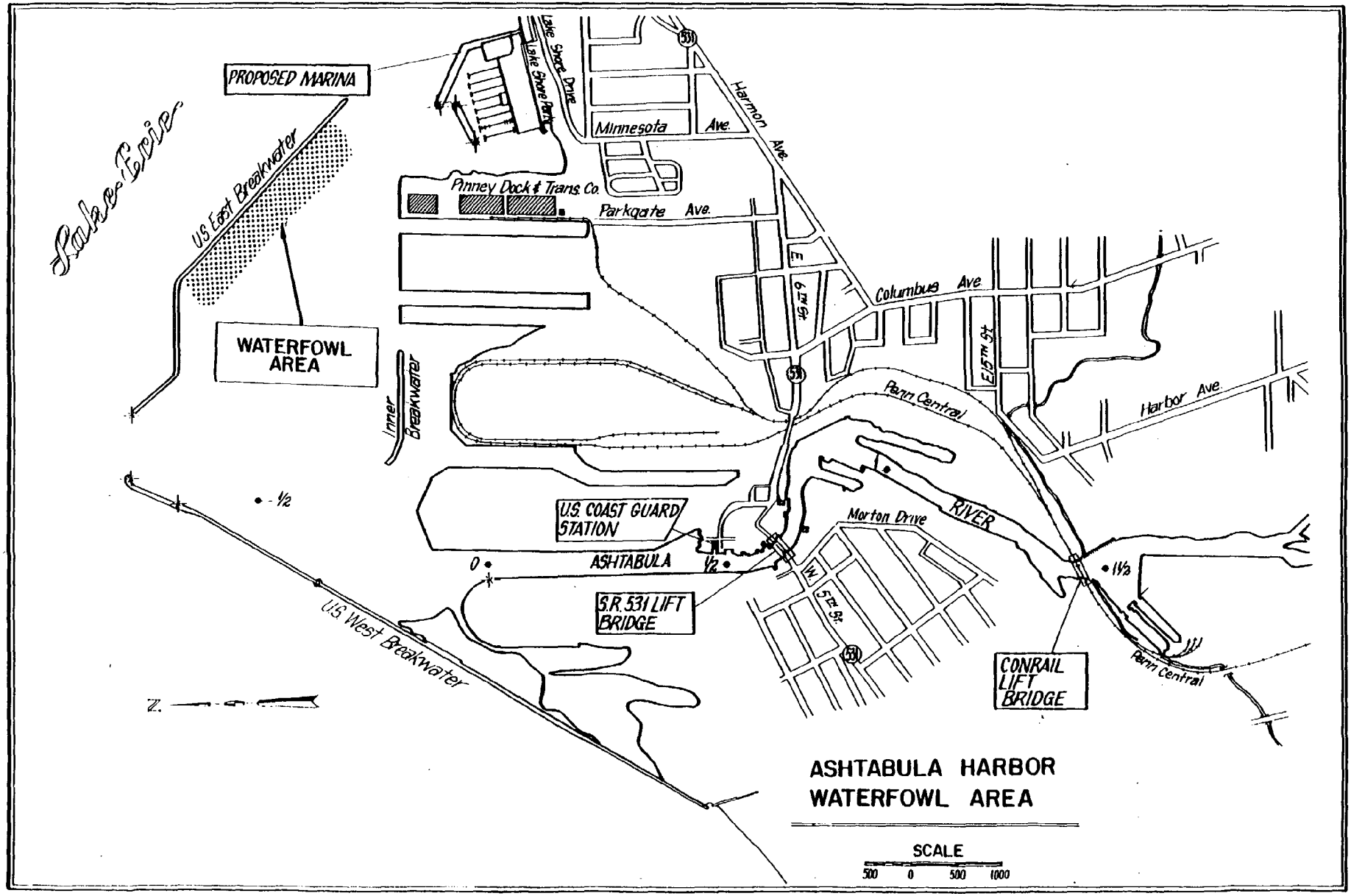

Lake Erie
PROPOSED MARINA
US East Breakwater
WATERFOWL AREA
Inner Breakwater
Lake Shore Drive
Lake Shore Park
Pinney Dock & Trans. Co.
Minnesota Ave.
Parkgate Ave.
Harmon Ave.
E. 6th St.
Columbus Ave
E. 15th St.
Harbor Ave.
Penn Central
U.S. COAST GUARD STATION
ASHTABULA
S.R. 531 LIFT BRIDGE
US West Breakwater
Morton Drive
RIVER
W. 5th St.
CONRAIL LIFT BRIDGE
Penn Central
ASHTABULA HARBOR
WATERFOWL AREA
SCALE
500 0 500 1000

FIG. III-2

and spreading of stirred sediments. It is anticipated that sediments shall be dredged hydraulically with minimal suspension of sediment.

The bottom material to be excavated is dense shale and should therefore settle out quickly after excavation operations. The stone in the rubblemound breakwaters shall be obtained from upland commercial sources and free of contaminants. Once the breakwaters are constructed they should help to contain the spread of suspended sediments. It is anticipated that filling to make land will be done with clean fill materials and in such a manner as to minimize introduction of fill material into the water. Safeguards will be taken to minimize any spillage of oil, gas or other contaminants from equipment and barges operating on the water.

Erosion: No significant erosion will occur during construction since little land excavation is anticipated. Field offices and equipment will occupy existing parking lot space.

Wildlife: Fish will be driven from the immediate area for the duration of construction. Important fishing areas such as around the Illuminating Company outflow and East Breakwater of Ashtabula Harbor will be unaffected.

As was stated earlier, the Corps of Engineers consulted with U.S. Fish and Wildlife Service in preparing the Beach Erosion Study. No mention was made of the existence of any threatened or endangered species in the Park Area. The waterfowl area mentioned earlier will not be affected. There are no known waterfowl nesting areas in the immediate project area. A 1979 CEIP project conducted by the Ohio Department of Natural Resources identified no rare, threatened or endangered plants or plant communities within the project area.

Noise: There will be a temporary increase in noise level in the immediate area due to the operation of large construction equipment. This noise should be restricted to the waterfront since the land rises 45 feet immediately south

of the project site and will direct the sound upward. This should effectively buffer the upper portions of the Park and inland residences from this construction noise. Some increase in truck traffic and accompanying noise may be experienced due to delivery of equipment or materials but this should not be much greater than noise associated with daily maintenance of the Park. Correspondingly, there will be a decrease in recreational traffic due to construction and closure of the Park campgrounds while the Beach Project is built.

Recreation: Since a portion of the boat ramp parking lot will be used for a field office, equipment storage, and other things; the parking area will be reduced and traffic patterns will be affected. This will in turn reduce the possible launch rate of the boat ramp. Necessary precautions will have to be taken to prevent the public from entering the construction site either on land or in the water. It is possible the ramp would have to be closed when work is being done on the west end of the marina, but this work may be scheduled early in the construction season to minimize its effect. Security fences shall be used on land and appropriate buoys and warning devices in the water to protect the site and the public. Construction will temporarily remove access to approximately 1,000 feet of lakefront abutting the marina. It will have to be determined during the project whether it will be possible to open the eastern breakwater to the public for fishing access before construction is completed. This would provide over 1,400 feet of access. It is anticipated that breakwater construction will be one of the first tasks achieved. This will provide a safe harbor for the waterborn construction equipment and also for boats using the launch ramp. Boaters could use it as a refuge in case of a sudden storm.

Traffic: Construction will not significantly affect traffic flow in the Park except for the boat launching ramp area. There are sufficient parking spaces elsewhere in the park to absorb vehicles displaced from this area. Both the Park Recreation Plan and the Corps of Engineers found the park roadways capable of handling the additional traffic related to construction.

PERMANENT IMPACTS OF THE PROPOSED PROJECT

Air Quality: Increased auto and boat traffic will cause a slight increase in internal combustion engine fumes. The significance of this increase is minimal considering the industrial facilities in Ashtabula Harbor and the surrounding area. Industrial activities included are materials handling such as coal and iron ore, power generation, and chemical manufacture and storage. Development of other areas of Lake Shore Park will result in increased auto traffic regardless of the marina. Thus it can be expected that present air quality would not be significantly degraded by the construction of the marina.

Water Quality: Recreational boats generally contribute incidental amounts of gasoline and motor oil to a harbor. The increase in marine traffic will result in slight increases in the amounts of these substances in the harbor. This situation can be minimized with strict supervision by the marina management to prevent large spills.

Stirring of sediments can be minimized by enforcement of harbor speed limits. This problem will be minimal since a large portion of the marina bottom is rock and sediments are present only on the west side of the site. Considerable amounts of this sediment will be removed by hydraulic dredging in the construction phase to achieve the desired depth. It is proposed to open-Lake dump the dredgings. A chemical analysis of the sediments is provided in the Project Soils Report, see Appendix C. The Corps of Engineers will make the determination as to whether open-Lake dumping is permissible in reviewing the project for the Section 404 (b) permit. Resuspension of sediment due to annual maintenance dredging should be no worse than that associated with annual dredging for the boat ramps at present. The effects are temporary since the water clears quickly after the dredging for the ramps.

There will be no degradation of water quality resulting from deposition

of materials connected with the project. All stone used in the rubblemound breakwater shall be clean and uncontaminated stone obtained from upland sites. All fill material shall be clean. Any metal associated with the bulkhead or floating docks shall be specified so as to prevent release of any contaminants into the harbor. Thus there will be no significant impact on the existing water quality. Beside the information provided in Corps of Engineers evaluation for the Beach Erosion and Shoreline Protection Project included as Appendix D, a number of other reports involving marinas and deposition of rubblemound materials in this general area of Lake Erie have been published. Two such documents are Draft Enviromental Impact Statement for the Cooperative Beach Erosion Project at Presque Isle Peninsula in Erie, Pennsylvania May 15, 1973 and Stage 2 Document for Reformulation Phase 1 General Design Memorandum Geneva-on-the-Lake, Ohio Small Boat Harbor, April 1980; both published by the U.S. Army Corps of Engineer.

Erosion: There will be very little land excavation involved with this project with no surface vegetation removal to expose earth for erosion. Therefore, there won't be any permanent erosion impacts associated with the marina.

Wildlife: As stated earlier, the waterfowl area inside the east breakwater of Ashtabula Harbor will not be affected by the marina and should benefit in the decrease of pleasure craft traffic through the area. The fish population tolerates the launching and operation of boats in the area at present. It is to be expected that they will return to the area once construction is complete if speed limits are enforced minimizing bottom disturbance and noise. As the number of launchings and docked boats increase, it is expected that the fish will leave the marina basin itself, but make use of the north side of the new breakwaters.

There will be greater water depth provided than previously. This loss of shallow water habitat will be offset by the construction of the beach immediately to the East of the marina. Breakwaters and made land will occupy 11.4 acres of lake bottom, potential yellow perch spawing area. The rubblemound breakwaters will provide 1.4 acres of new and more varied habitat. With the interstices in in rubblemound construction, the area provided is actually much greater than 1.4 acres. This new habitat would attract additional fish to the area.

Noise: The natural rise of the land south of the project site should protect neighboring houses and the rest of the Park from any increases in noise due to the marina. Noise attributable to increased car traffic and increased number of individuals using the Park should not be greater for the mairna than for other improvements planned for the Park such as the beach reconstruction. Increases were found to be insignificant for that case. Enforcement of marina regulations regarding noise levels (such as radios) and harbor speed limits will help to minimize any noise level increases

Recreation: The basis of this project is providing additional recreational opportunities for the public. There are no negative recreational impacts.

The marina will provide additional and improved dock space on Lake Erie. The need for additional space is demonstrated in the Financial Feasibility section of this report. The project also provides safer and more convenient boating access than the existing marinas on the Ashtabula River. The lengthy trip down the river and through harbor freighter traffic isn't necessary. Access to Lake Erie is increased with additional dock space and the full utilization of the 3-lane boat launching ramp. An additional harbor of refuge is provided for small craft and fishing boats in case of a sudden storm.

Fishing opportunities are increased and improved. The east breakwater will provide approximately 1,400 feet of fishing access. In addition, access to deeper water will be provided, offering the opportunity of catching a greater variety and larger size fish. Moderate size commercial fishing boats can be docked in the marina. This project augments the use of other Lake Shore Park facilities such as picnic facilities, the beach, the new playground and so on.

The east breakwater separates boating and swimming activities. Enforcement of regulations in both the marina and swimming areas will minimize any safety risks. Safety will be maintained in the marina through clear marking of navigation channels and strict enforcement of speed regulations. This will be an improvement over current unmarked condititons. Safety equipment shall be available at both the beach and the marina and all Park personnel shall be acquanted with its use.

Other impacts: Since the location of the marina is at the extreme western end of the Park, scenic vistas will be relatively unaffected. The marina will become part of the vista currently dominated by the Pinney Dock.

The possible relocation of the Ashtabula U.S. Coast Guard Station into the marina would be a beneficial impact. The Coast Guard could respond more quickly to emergencies on the open Lake. This is true because from their present location on the Ashtabula River they must observe river and inner harbor speed limits as well as avoiding harbor traffic in responding to an emergency.

No other impacts have been identified.

Floodplain Concerns: Since the project is construction of a recreational boat marina on Lake Erie, the project site has to be within the Lake Erie 100-year floodplain. There is no viable alternative to this development site.

This project is not likely to encourage residential, commercial, or industrial development in the 100-year floodplain as adjacent lands are completely developed.

The Lake Shore Park Development Plan, which contains information regarding the construction of this project, has been publically available since December 1979. Various announcements in local newspapers have identified the availability of the Plan and solicited comments on any portion contained therein. No comments on the proposed construction have been received.

Wetland Concerns: This project is not located in a wetland, nor is it likely to promote residential, commercial, or industrial development in a wetland, as there are none in the immediate vicinity.

Historic Preservation: The Ohio Historic Preservation Office has been consulted concerning this project. Included is a copy of their response stating that the project won't affect any property listed in or eligible for listing in the National Register of Historic Places, see Exhibit III-4.

Ohio Historic Preservation Office
Ohio Historical Center I-71 & 17th Avenue Columbus, Ohio 43211 (614) 466-1500

October 22, 1980

Mr. Albert J. Malinak, P. E.
Woodruff, Inc.
23875 Commerce Park Road
Cleveland, Ohio 44122

Re: Lake Shore Park Boat Marina
Ashtabula, Ohio

Dear Mr. Malinak:

This is in response to your letter of October 8, 1980, requesting our comments on the above proposed project.

The staff of the Ohio Historic Preservation Office has reviewed the maps and other documentation provided with your correspondence. It appears from this information that the proposed undertaking will not affect any significant cultural resources, either historic or archaeological, eligible for, nominated to or listed in the National Register of Historic Places. We recommend that you proceed with this project.

Thank you for the opportunity to review and comment on the Lake Shore Park boat marina.

Sincerely,

Dellas H. Harder
Acting State Historic
Preservation Officer

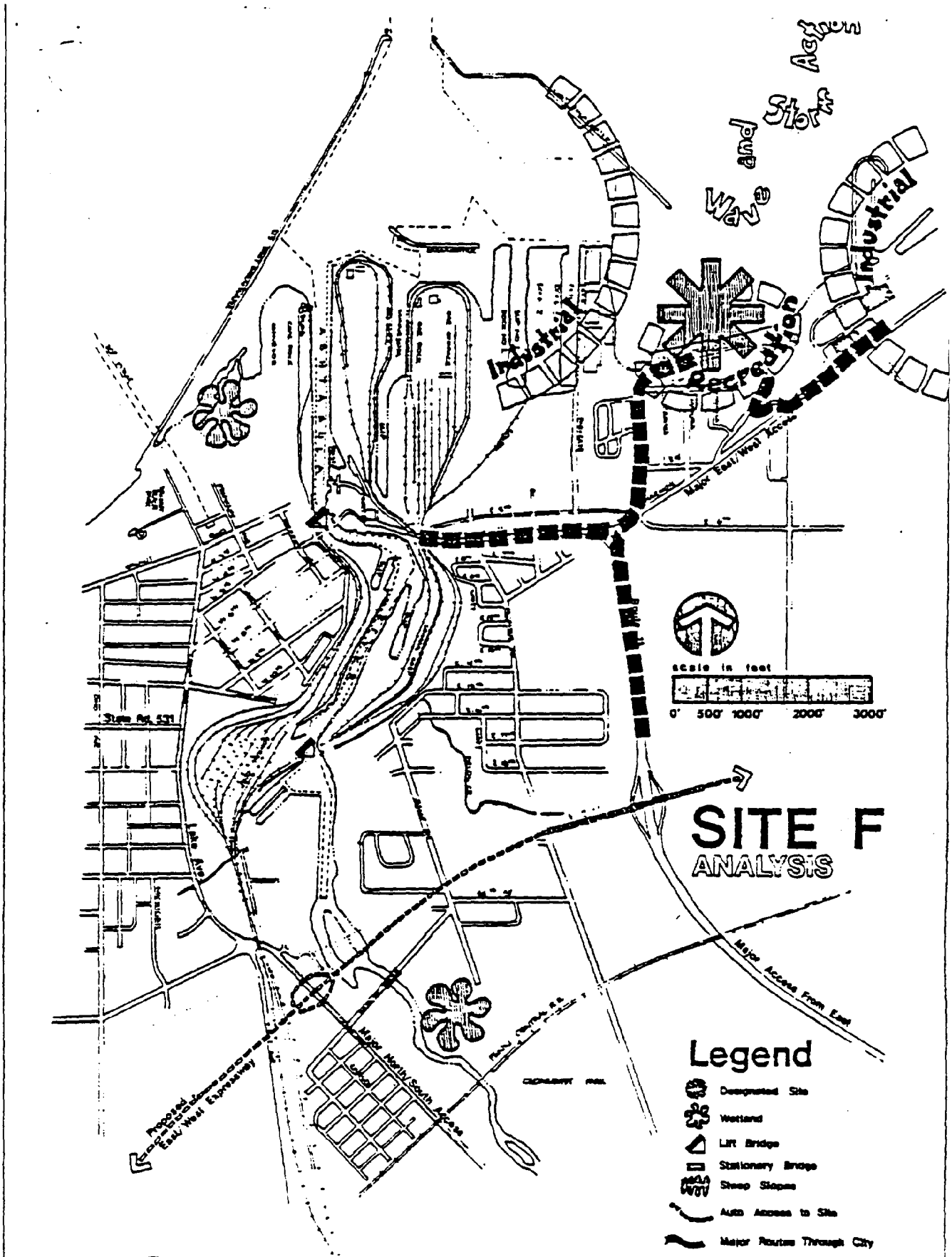
DHH:LS:as

RECEIVED
OCT 24 1980
WOODRUFF, INC.

Alternatives: As has been previously stated, a number of studies for developing a marina in the Ashtabula area have been done. In 1965, the City of Ashtabula had a feasibility study done for the development of a municipal recreational marina on land it had bought along the Ashtabula River. The report entitled Feasibility Survey Report (Technical and Economic) of Proposed Recreational Marina, Ashtabula, Ohio was done by Rosenstock-Holland-Associates of Akron, Ohio as a Technical Assistance Project for Area Redevelopment Administration of U.S. Department of Commerce. This report concluded that there was a great need for additional dock space in Ashtabula and spelled out the features the marina should have. The City never built the marina and, in fact, a private marina operator purchased the land from the City. The extensive rehabilitation and expansion of the site proposed in the report was not done however.

In 1978, the Snell Environmental Group performed a Harbor Marina Master Plan Study - 1978 for the Ashtabula Port Authority. This report involved six possible marina sites in and around the Ashtabula Harbor, among them was Lake Shore Park, referred to as "Site F". The various sites were evaluated on 15 different criteria and assigned a certain point value accordingly. Included as Exhibit III-5, are the site plan and description of "Site F" and the table "Summary Comparison of Sites". As can be seen from this table, Lake Shore Park, "Site F". was the highest rated of the sites. A more complete copy of this study was included with the loan application for this project.

The alternative of no development would not alleviate the demonstrated need for permanent recreational docking space in the area. Neither would this option permit satisfaction of local priorities nor implementation of redevelopment activities identified in 308 (c) (1) Park Development Plan. Implementation of completed local plans is an expressed objective of the Coastal Energy Impact Program and the Ohio Coastal Zone Management program.



HARBOR MARINA MASTER PLAN STUDY

ASHTABULA, OHIO

prepared by:

Site F

LOCATION- Of this site is considered excellent because it is in the Ashtabula Harbor on the Lake and is adjacent to Lake Shore Park.
AUTO ACCESS- Is considered very good because it is off of Harmon Road or State Road #531 and is also very close to the termination point of Route #11 which enters the City from the south.
DRAW- Would be very good for several reasons, including its relationship to Lake Shore Park, which already draws many persons to the area and its overall location and access by auto.
AREA CHARACTER- Is very good because it is located within the Harbor area and located adjacent to many recreational facilities. Perhaps the only scar on the quality of the surroundings would be the power plant directly east.
SIZE&SHAPE- Is considered very good. The land area will require expansion into the lake, but there is plenty of water area to do this.
DISTANCE FROM LAKE- Is excellent, for obvious reasons.
WATER FACTORS- Are only fair and this is because of wave action and other influences of the lake which would be rough on small boats. This would change with construction of a breakwater. In fact, a breakwater is a prerequisite for a marina in this location.
OGRAPHY- Is considered as good. The land area between the existing shoreline and the steep embankment is limiting.
PRESENT CONDITION- Is very good and includes many ideal features, such as, views and good support facilities.
COMPATIBILITY TO SURROUNDINGS- Are rated very good. The park is of excellent quality and would provide an ideal working relationship.
UTILITIES- Are rated good, as are all sites.
DEMAND FOR FACILITIES- Is considered very good not only for the marina, but also for one in this location.
PRESENT OWNERSHIP- Is very good as it is available through cooperation with the Ashtabula Township Parks Commission.
ENVIRONMENTAL ASSESSMENT- Is also very good. Since the site is already intensely used, little overall change to environmental quality would result.

SUMMARY- This site should receive high consideration for a small craft marina. It should be pointed out, however, that an additional breakwater is a prerequisite to such a development. The most positive aspects are the location on the lake, its juxtaposition to Lake Shore Park and its auto access.

NEEDS

There have been numerous boat counts in the past, which all indicate a need to develop marina space in Ashtabula. The need as exhibited in a 1965 report by Rosenstock-Holland Associates states that the projected need as of 1970 would be 1500 mooring spaces. This need for mooring spaces also included the area around Ashtabula.

Also considered in this study were present plans, at that time, (1965) for marina development in both Ashtabula and Conneaut which still left the 1500 projected figure. Since the 1965 report, there have been facilities developed in Conneaut and plans for Geneva on the Lake, however, the 769 spaces projected for Ashtabula, at that time, have not been developed and the 298 berths in the report have only increased by an estimated 50 spaces. An official 1978 count is not available, but it has been estimated at 350 mooring spaces by the Ashtabula Port Authority. Based on these figures, the need for the Ashtabula Area is still in excess of 1500 and perhaps as high as 2000. The actual need for berthing spaces in Ashtabula is influenced by development at other facilities along Lake Erie, since this shoreline actually serves an approximately 50 mile radius. Only a percentage of persons with boats berthed in Ashtabula, actually live there. So it is conceivable that if the market is not developed in Ashtabula, expansion of facilities at other ports along the lake could absorb much of the needs projected for Ashtabula. This would represent a lost revenue for the City of approximately $2,140,000 per year. This figure was derived from "a study by the Army Corp of Engineers titled "Evaluation of Economic Feasibility of Maintenance of a Recreational Channel at Ashtabula Harbor, Ohio" which was completed to determine the cost/benefits ratio of dredging the river for continued

use by the recreational fleet in Ashtabula. The benefit of $476,540 to be derived for boats permanently docked was based on a fleet of 239 boats ranging in size from 16'-25' to 40'-64'. Note: This figure used a percentage of the actual value of the boats as an annual benefit. For instance, a cruiser of 40'-64' in length has an average value of $86,825. In this case, the annual cost to maintain and use the boat would be 9% of its value or $7,800. This figure includes; cost of maintenance, storage, fuel, supplies and other associated costs. Assuming a fleet of 1500 boats to have a similar representational cross section, the revenue generated from 1500 additional mooring spaces would be $2,850,000. However, we know that the average size of boats berthed would be smaller, if sufficient facilities existed, since a lot of boats now launched would be berthed and these are generally smaller boats. Hence the revenue per boat is estimated at 25% less, which would reduce the $2,850,000 estimate to $2,140,000 per year.

In addition to the potential revenue of $2,140,000 based on 1500 additional mooring spaces, there are numerous indirect economic benefits. All of the additional persons employed to meet the needs of the marina would have needs of their own, such as, food, housing and clothes. This, along with the taxes they pay, would provide much additional revenue for Ashtabula and should not be overlooked as a benefit to the City.

SUMMARY The estimated shortage of berthing spaces in the Ashtabula is in excess of 1500 and perhaps as high as 2000. Keep in mind that there are a lot of factors which determine the needs and not any one survey can be depended on to represent the actual need. For this reason, it is recommended that any such development should be done in stages

Summary Comparison of Sites

CRITERIA	A		B		C		D		E		F	
	Evaluation	Pts	Evaluation	Pts	Evaluation	Pts	Evaluation	Pts	Evaluation	Pts	Evaluation	Pts
LOCATION	excellent	60	good	30	fair	15	good	30	poor	0	excellent	60
AUTO ACCESS	good	50	very good	75	fair	25	very good	75	very good	75	very good	75
DRAW	very good	45	good	30	good	30	good	30	good	30	very good	45
AREA CHARACTER	very good	30	fair	10	very good	30	very good	30	very good	30	good	20
SIZE - SHAPE	good	50	excellent	100	good	50	good	50	very good	75	very good	75
DISTANCE FROM LAKE	excellent	80	fair	20	fair	20	poor	0	poor	0	excellent	80
WATER FACTORS	fair	25	good	50	good	50	poor	0	poor	0	fair	25
TOPOGRAPHY	good	30	good	30	poor	0	good	30	very good	45	good	30
PRESENT CONDITION	fair	5	fair	5	good	10	good	10	good	10	very good	15
COMPATIBILITY TO SURROUNDINGS	good	40	fair	90	good	40	good	40	good	40	very good	60
COMPLEMENTARY FACILITIES	good	30	fair	15	fair	15	poor	0	poor	0	good	30
DEMAND FOR FACILITIES	good	10	good	10	good	10	good	10	good	10	good	10
UTILITIES	very good	30	good	20	good	20	good	20	good	20	very good	30
PRESENT OWNERSHIP	very good	30	fair	10	fair	10	good	20	good	20	very good	20
ENVIRONMENTAL ASSESSMENT	fair	15	very good	45	very good	45	very good	45	poor	0	very good	45
TOTAL POINTS		530		470		370		390		355		620

EXHIBIT III - 5

The design alternatives considered are presented and discussed in the Project Description section of this report. Alternate 3 is the preferred alternate for a number of reasons spelled out in the discussion.

INTERGOVERNMENTAL COORDINATION

A description of the involvement of the various Federal, state and local agencies in this project can be found in Environmental Assessment Information section of this report. All concerned state agencies have reviewed the loan application through the State of Ohio A-95 Clearinghouse Review process. See Exhibit III-6.

SITING

The marina is sited in accordance with the latest master plan for the area, that being the Lakeshore Park Recreation Plan. As is discussed in the Financial Feasibility Study, Appendix A, the site has excellent highway and water access. Users will be able to use the many other recreational facilities available in Lake Shore Park, such as tennis courts, playground, picnic areas, and the future beach.

RELOCATION ASSISTANCE

No relocation assistance is required for this project. All additional land required for the project is Lake Erie submerged land which is owned by the State of Ohio. An application to lease the land required has been filed.

WILLIAM P. FERGUS, P.E.
DIRECTOR

July 14, 1980

Ashtabula Twp. Park Board
E. First Street & Minola
Ashtabula, Ohio 44004

ATT: MICHAEL ADAMS

A-95 AREAWIDE CLEARINGHOUSE REVIEW

RE: Lake Shore Park Marina Construction Project

Dear Mr. Adams:

The A-95 review of the above referenced proposal was completed on July 14, 1980.

Clearinghouse review comments, if any, and a copy of the official resolution of the General Policy Board of the Eastgate Development and Transportation Agency indicating support for your proposal are enclosed.

We recommend that you include a copy of the resolution with your application and proceed with your request. If you have any questions concerning this action please contact the Eastgate Development and Tranportation Agency.

We thank you for your cooperation and wish you success in your endeavor.

Sincerely,

EASTGATE DEVELOPMENT AND
TRANSPORTATION AGENCY

William P. Fergus

William P. Fergus, P.E.
Director

RECEIVED
APR 1981
WOODRUFF, INC.

WPF/ml

Enclosure

cc: State Clearinghouse

EASTGATE DEVELOPMENT AND TRANSPORTATION AGENCY
130 JAVIT COURT, YOUNGSTOWN, OHIO 44515
☎ 216 / 793-3282 YOUNGSTOWN
373-1921 WARREN

GPB RESOLUTION # 131
A-95 LOG # 80-200

RESOLUTION
SUPPORTING THROUGH THE A-95 REVIEW PROCESS AN APPLICATION BY THE ASHTABULA TOWNSHIP PARK BOARD TO THE OFFICE OF COASTAL ZONE MANAGEMENT FOR FUNDS TO CONSTRUCT A RECREATIONAL BOAT MARINA IN LAKE SHORE PARK

WHEREAS, the Ashtabula Township Park Board is making application to the Office of Coastal Zone Management for funds to construct a recreational boat marina in Lake Shore Park; and

WHEREAS, the Eastgate Development and Transportation Agency (hereinafter called EDATA), State of Ohio, has reviewed this application under requirements issued by the U.S. Office of Management and Budget in Circular A-95.

NOW, THEREFORE, BE IT RESOLVED By the General Policy Board of EDATA that this application being submitted to the Office of Coastal Zone Management be hereby supported.

BE IT FURTHER RESOLVED, that the EDATA staff be directed to review this proposed project for its conformance with areawide plans and that said comments be made a part of this resolution.

BE IT FURTHER RESOLVED, that the EDATA staff be directed to forward a copy of this resolution and a copy of all written comments to the applicant and applicable local, state, and federal agencies.

Passed this 10th day of July, 1980.

ATTEST:

William Jones
Director

Edward E Ryder
Chairman

SECTION IV

CONSTRUCTION CRITERIA

CONSTRUCTION CRITERIA

A discussion of the design criteria used for the various portions of the project follows.

Breakwater design was accomplished using methods for rubblemound construction from the Shore Protection Manual published by the U.S. Army Coastal Engineering Research Center. A 10-year maximum monthly mean lake level plus 1-year short term fluctuation were used for the design lake level (DLL). A 20-year deepwater wave was used in design. These values were obtained from Technical Report H-76-1, Design Wave Information for the Great Lakes Report Lake Erie from the U.S. Army Engineer Waterways Experiment Station. The design allowable wave height within the harbor is one foot.

After considerable research, it was decided that the desirable depth for the marina would be 6 feet below Low Water Datum (LWD). LWD is elevation 568.6 feet above Mean Water Level at Father Point Quebec, (International Great Lakes Datum 1955). This depth was found to be acceptable to the Coast Guard should they relocate to the marina.

The use of floating docks is proposed for the marina walkways and finger piers. This is the most direct method of coping with the large possible variation in the Lake Erie water level (5.8 feet between highest and lowest recorded monthly mean levels). Layouts were based on the use of 5' wide walkways and 3' wide finger piers, 25' long. The clear width between fingers is 25'. In the final design, various length finger piers with variation in slip widths would be designed. Water and electrical lines would be run out along the sides of walkways to provide these services to each berth.

A steel bulkhead is proposed to contain the fill for the marina parking area. It would consist of steel H piles concreted into the existing shale with horizontal beams connecting them to form a steel framework. Steel sheet piling

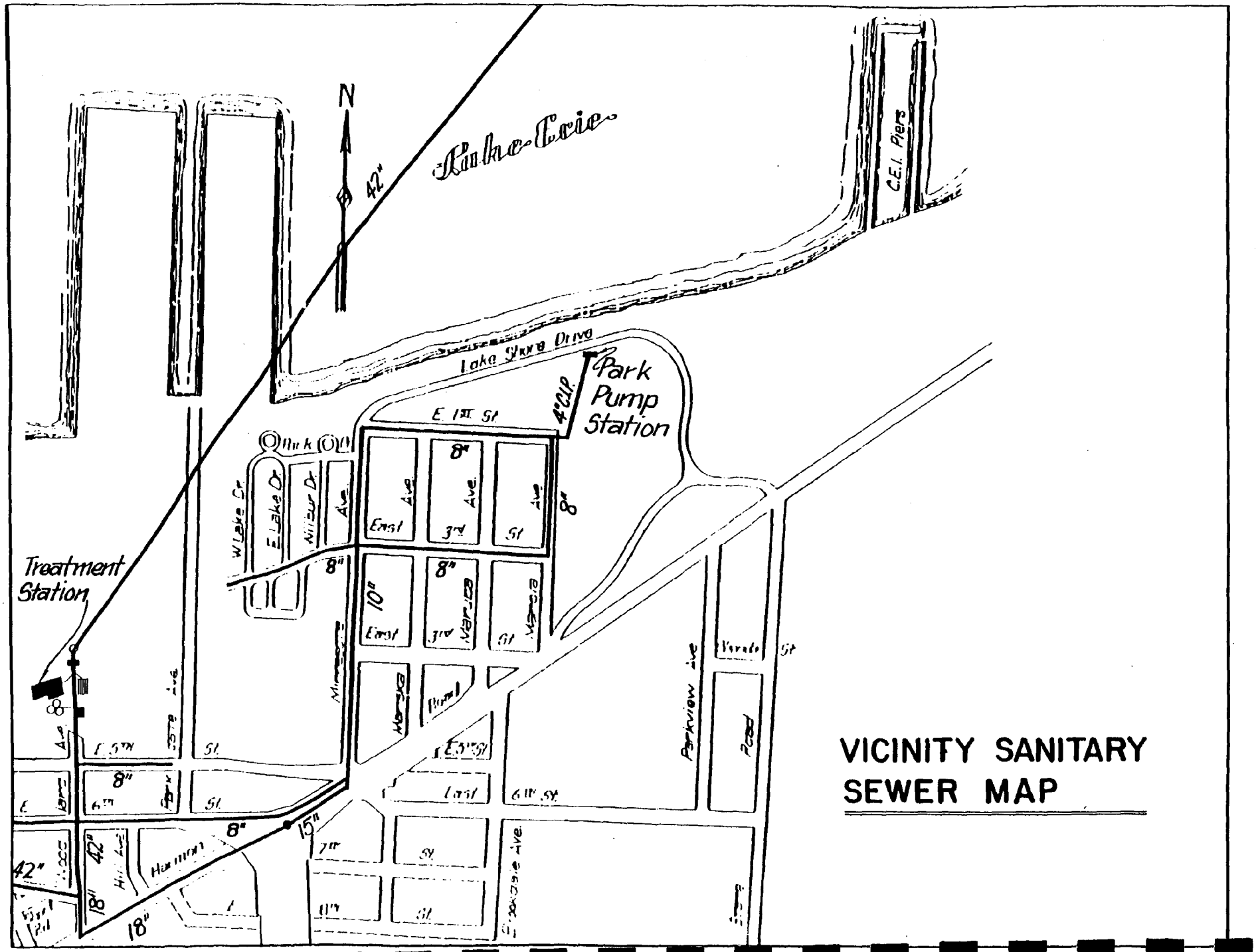
would be attached to this framework. Sheet piling cannot be driven because of the hard shale bottom. A concrete beam would be poured at the base of the sheet piling to create a seal and concrete cap beam would be poured at the top. Filling would start immediately behind the bulkhead and work inward. This is just one possible scheme of attack. Discussions would be held with experienced Lake contractors before a system was proposed for the final design.

Pavement designs take into account exposure to the Lakefront weather and the use imposed. The access roadways will receive heavy use and the boat launching ramp parking involves the extra loads of trailered boats. The pavement for these areas would consist of 8" of aggregate base, a 1-1/2" asphalt intermediate coarse, and a 1" asphalt wearing coarse. The marina and fishing parking should handle only passenger cars and the pavement is a little thinner. It consists of 6" of aggregate base, a 1" asphalt intermediate coarse, and a 1" asphalt wearing coarse.

All reinforced concrete design shall be in accordance with the latest edition of the American Concrete Institute Building Code and applicable local codes. Steel design shall be done according to the latest edition of the AISC code and local codes. Specialized steel design such as a steel bulkhead will be designed using appropriate guidelines.

Lighting for both the parking lots and the marina walkways would be designed according to accepted industry standards. Electricity for the lighting as well as providing electrical service to the berths and buildings is available along Lake Shore Drive south of the project site. It is a similar situation for water. Storm drainage will be provided for the parking lots and the water routed back into the Lake. A pump-out station for boats and sanitary facilities in the main building will require a small holding tank and pump station. The

sewage will be pumped to the large Park pump station located on the south side of Lake Shore Drive across from the Park Pavillion. A map, Figure IV-1 illustrates the sanitary sewer system in the local area. The anticipated average daily flow is 51,000 gallons based upon 125 gpd per slip. The existing Park facilities should be capable of handling this additional flow.



VICINITY SANITARY SEWER MAP

FIG. IV-1

SECTION V
COST ESTIMATES

CONSTRUCTION COST ESTIMATES

Following are construction cost estimates developed for the four alternates. The various items are listed and grouped under the headings of Breakwaters, Harbor, Parking Lot, Utilities, and Buildings. 1979 unit prices for the Northeast Ohio area are used.

These estimates are used in comparing the Alternates to make a recommendation for the preferred one. It must be noted that all these estimates are prepared based on the design criteria explained in the Design Criteria Section of this report and therefore, are on an equal footing with each other. A number of changes can be made to lower construction costs, but they would result in a slightly less satisfactory design. Breakwater sizes could be reduced if the design year or allowable wave height within the harbor were changed. If it were decided to accept a variable draft harbor instead of the six feet below LWD depth, dredging and rock excavation costs could be reduced. If some type of dock system such as the use of precast concrete double tees would be acceptable, savings could be realized over floating docks. Something would have to be done to cope with the variation in Lake level so that the possible trade-offs would have to be examined. Changes in items related to the parking lots such as pavement designs, curbs, and so on could effect cost savings. It would be expected that other opportunities for cutting costs could be found. One major consideration is the future Coast Guard Station area. Should it be decided that the Coast Guard won't relocate to the marina before final design is accomplished, it is recommended to delete that area from the design and make necessary changes in the layout. This would result in great savings in made land and bulkhead construction.

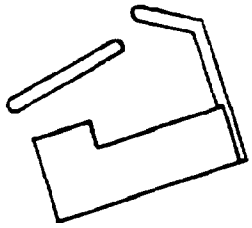
These estimates represent a sound basis for cost comparison of the studied alternates. They should not be regarded as final design construction estimates.

COST ESTIMATE

FOR

LAKE SHORE PARK MARINA

ALTERNATE 1



ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Breakwaters				
Mobilization & Demobilization		LUMP SUM		$ 50,000
Armor Stone				
6-14 TONS	39,800	TON	$ 30.00	1,194,000
2- 4 TONS	8,240	TON	32.00	263,700
1- 2 TONS	10,500	TON	32.00	336,000
Underlayer Stone				
700-2900#	9,920	TON	27.50	273,000
190- 775#	2,360	TON	29.00	68,400
100- 400#	3,220	TON	29.00	93,400
Bedding Stone				
2-145#	15,100	TON	21.00	317,000
½- 40#	5,210	TON	21.00	109,000
¼- 20#	7,090	TON	22.00	156,000
SUBTOTAL				$2,860,500
Harbor				
Mobilization & Demobilization		LUMP SUM		50,000
Rock Excavation	19,700	C.Y.	25.00	493,000
Dredging	8,950	C.Y.	8.00	71,600
Floating Docks-including water, electric & lighting	408	PER BOAT	1,750.00	714,000
SUBTOTAL				$1,328,600

ALTERNATE 1 (CONTINUED)

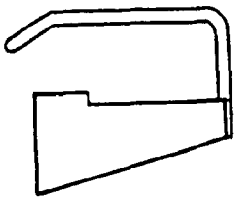
ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMAT PRICE
Parking Lot				
Steel Bulkhead	1,857	L.F.	$ 300.00	$ 557,0
Excavation not including embankment	3,000	C.Y.	6.00	18,0
Embankment	88,100	C.Y.	7.00	617,0
Asphalt Pavement				
Parking Lot	14,600	S.Y.	13.50	197,0
Roadways	3,540	S.Y.	20.00	70,8
Curbs	3,400	L.F.	8.25	28,0
Concrete Walk	7,700	S.F.	2.75	21,2
Reinforced Concrete	300	C.Y.	300.00	90,0
Handrail	1,250	L.F.	12.00	15,0
Lignting-includes lighting standards, cable & all other necessary equipment in place		LUMP SUM		12,0
Topsoil	500	C.Y.	10.00	5,0
Seeding & Mulching includes fertilizer	5,300	S.Y.	1.50	7,9
Landscaping		LUMP SUM		8,0
Subtotal				$1,646,9
Utilities				
Storm Sewer	900	L.F.	30.00	27,00
Storm Manholes	2	EACH	1,000.00	2,00
Catch Basins	5	EACH	800.00	4,00
Sanitary Sewer	900	L.F.	25.00	22,50
Sanitary Manholes	2	EACH	1,000.00	2,00
Pump Station		LUMP SUM		10,0
Waterline	1,350	L.F.	35.00	47,3
Fire Hydrants	3	EACH	1,500.00	4,5
Subtotal				$ 119,3
Buildings				
Restaurant/Boat Store	3,750	S.F.	100.00	375,0
Shower/Rest Rooms	1,750	S.F.	100.00	175,0
Marine Service Station		LUMP SUM		$ 15,000
Subtotal				$565,000
Aids to Navigation	3	EACH	15,000.00	45,000
TOTAL ESTIMATED CONSTRUCTION PRICE 1979				$6,565,350
TOTAL ESTIMATED CONSTRUCTION PRICE 1982 @ 10% INFLATION				$8,740,000

COST ESTIMATE

FOR

LAKE SHORE PARK MARINA

ALTERNATE 2



ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Breakwaters				
Mobilization & Demobilization		LUMP SUM		$ 50,00
Armor Stone				
6-14 TONS	45,100	TON	$ 30.00	1,353,000
2- 4 TONS	6,700	TON	32.00	214,40
1- 2 TONS	7,350	TON	32.00	235,20
Underlayer Stone				
700-2900#	11,200	TON	27.50	308,00
190- 775#	1,920	TON	29.00	55,70
100- 400#	2,250	TON	29.00	65,300
Bedding Stone				
2-145#	17,000	TON	21.00	357,00
½- 40#	4,240	TON	21.00	89,000
¼- 20#	4,970	TON	22.00	109,300
SUBTOTAL				$2,836,90
Harbor				
Mobilization & Demobilization		LUMP SUM		50,000
Rock Excavation	20,300	C.Y.	25.00	507,500
Dredging	9,780	C.Y.	8.00	78,200
Floating Docks-including water, electric & lighting	422	PER BOAT	1,750.00	738,500
				$1,374,200

ALTERNATE 2 (CONTINUED)

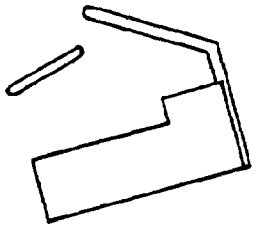
ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Parking Lot				
Steel Bulkhead	1,640	L.F.	$ 300.00	$ 492,000
Excavation not including embankment	3,000	C.Y.	6.00	18,000
Embankment	85,700	C.Y.	7.00	600,000
Asphalt Pavement				
Parking Lot	13,500	S.Y.	13.50	182,000
Roadways	3,440	S.Y.	20.00	68,800
Curbs	2,900	L.F.	8.25	23,900
Concrete Walk	4,630	S.F.	2.75	12,700
Reinforced Concrete	450	C.Y.	300.00	135,000
Handrail	800	L.F.	12.00	9,600
Lignting-includes lighting standards, cable & all other necessary equipment in place		LUMP SUM		14,000
Topsoil	500	C.Y.	10.00	5,000
Seeding & Mulching includes fertilizer	7,090	S.Y.	1.50	10,600
Landscaping		LUMP SUM		7,000
SUBTOTAL				$1,578,600
Utilities				
Storm Sewer	740	L.F.	30.00	22,200
Storm Manholes	2	EACH	1,000.00	2,000
Catch Basins	5	EACH	800.00	4,000
Sanitary Sewer	1,020	L.F.	25.00	25,500
Sanitary Manholes	1	EACH	1,000.00	1,000
Pump Station		LUMP SUM		10,000
Waterline	1,050	L.F.	35.00	36,800
Fire Hydrants	3	EACH	1,500.00	4,500
SUBTOTAL				$ 106,000
Buildings				
Restaurant/Boat Store	1,500	S.F.	100.00	150,000
Shower/Rest Rooms	1,700	S.F.	100.00	170,000
Marine Service Station		LUMP SUM		$ 15,000
				$ 335,000
Aids to Navigation	1	EACH	15,000.00	$ 15,000
TOTAL ESTIMATED CONSTRUCTION PRICE 1979				$ 6,245,700
TOTAL ESTIMATED CONSTRUCTION PRICE 1982 @ 10% INFLATION				$ 8,310,000

COST ESTIMATE

FOR

LAKE SHORE PARK MARINA

ALTERNATE 3



ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Breakwaters				
Mobilization & Demobilization		LUMP SUM		$ 50,000
Armor Stone				
6-14 TONS	37,300	TON	$ 30.00	1,119,000
2- 4 TONS	8,040	TON	32.00	257,000
1- 2 TONS	6,720	TON	32.00	215,000
Underlayer Stone				
700-2900#	9,290	TON	27.50	255,000
190- 775#	2,300	TON	29.00	66,700
100- 400#	2,060	TON	29.00	59,700
Bedding Stone				
2-145#	14,100	TON	21.00	296,000
½- 40#	5,090	TON	21.00	107,000
¼- 20#	4,540	TON	22.00	99,900
SUBTOTAL				$2,525,300
Harbor				
Mobilization & Demobilization		LUMP SUM		50,000
Rock Excavation	10,200	C.Y.	25.00	255,000
Dredging	7,920	C.Y.	8.00	63,400
Floating Docks-including water, electric & lighting	408	PER BOAT	1,750.00	714,000
SUBTOTAL				$1,082,400

ALTERNATE 3 (CONTINUED)

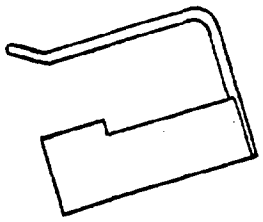
ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Parking Lot				
Steel Bulkhead	1,940	L.F.	$ 300.00	582,000
Excavation not including embankment	3,000	C.Y.	6.00	18,000
Embankment	104,000	C.Y.	7.00	728,000
Asphalt Pavement				
Parking Lot	14,300	S.Y.	13.50	193,000
Roadways	8,260	S.Y.	20.00	165,000
Curbs	4,520	L.F.	8.25	37,300
Concrete Walk	7,400	S.F.	2.75	20,400
Reinforced Concrete	300	C.Y.	300.00	90,000
Handrail	1,050	L.F.	12.00	12,600
Lignting-includes lighting standards, cable & all other necessary equipment in place		LUMP SUM		14,000
Topsoil	500	C.Y.	10.00	5,000
Seeding & Mulching includes fertilizer	6,260	S.Y.	1.50	9,400
Landscaping		LUMP SUM		10,000
SUBTOTAL				$1,884,700
Utilities				
Storm Sewer	1,250	L.F.	30.00	37,500
Storm Manholes	2	EACH	1,000.00	2,000
Catch Basins	7	EACH	800.00	5,600
Sanitary Sewer	930	L.F.	25.00	23,300
Sanitary Manholes	2	EACH	1,000.00	2,000
Pump Station		LUMP SUM		10,000
Waterline	1,310	L.F.	35.00	45,900
Fire Hydrants	3	EACH	1,500.00	4,500
SUBTOTAL				$ 130,800
Buildings				
Restaurant/Boat Store	3,750	S.F.	100.00	375,000
Shower/Rest Rooms	1,750	S.F.	100.00	175,000
Marine Service Station		LUMP SUM		$ 15,000
				$ 565,000
Aids to Navigation	3	EACH	15,000.00	45,000
TOTAL ESTIMATED CONSTRUCTION PRICE 1979				$6,233,200
TOTAL ESTIMATED CONSTRUCTION PRICE 1982 @ 10% INFLATION				$8,300.000

COST ESTIMATE

FOR

LAKE SHORE PARK MARINA

ALTERNATE 4



ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED PRICE
Breakwaters				
Mobilization & Demobilization		LUMP SUM		$ 50,000
Armor Stone				
6-14 TONS	27,600	TON	$ 30.00	828,000
2- 4 TONS	9,370	TON	32.00	300,000
1- 2 TONS	10,400	TON	32.00	333,000
Underlayer Stone				
700-2900#	6,870	TON	27.50	189,000
190- 775#	2,690	TON	29.00	78,000
100- 400#	3,190	TON	29.00	92,500
Bedding Stone				
2-145#	10,400	TON	21.00	218,000
½- 40#	5,930	TON	21.00	125,000
¼- 20#	7,030	TON	22.00	155,000
SUBTOTAL				$2,368,500
Harbor				
Mobilization & Demobilization		LUMP SUM		50,000
Rock Excavation	8,980	C.Y.	25.00	225,000
Dredging	9,930	C.Y.	8.00	79,400
Floating Docks-including water, electric & lighting	422	PER BOAT	1,750.00	738,500
				$1,092,900

ALTERNATE 4 (CONTINUED)

ITEMS	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATE PRICE
Parking Lot				
Steel Bulkhead	1,755	L.F.	$ 300.00	$ 527,00
Excavation not including embankment	3,000	C.Y.	6.00	18,00
Embankment	95,100	C.Y.	7.00	666,00
Asphalt Pavement				
Parking Lot	13,700	S.Y.	13.50	185,00
Roadways	9,680	S.Y.	20.00	194,00
Curbs	4,770	L.F.	8.25	39,40
Concrete Walk	5,100	S.F.	2.75	14,00
Reinforced Concrete	300	C.Y.	300.00	90,00
Handrail	910	L.F.	12.00	10,90
Lignting-includes lighting standards, cable & all other necessary equipment in place		LUMP SUM		14,00
Topsoil	350	C.Y.	10.00	3,50
Seeding & Mulching includes fertilizer	4,000	S.Y.	1.50	6,00
Landscaping		LUMP SUM		8,00
SUBTOTAL				$1,775,80
Utilities				
Storm Sewer	1,030	L.F.	30.00	30,900
Storm Manholes	2	EACH	1,000.00	2,000
Catch Basins	8	EACH	800.00	6,400
Sanitary Sewer	1,210	L.F.	25.00	30,300
Sanitary Manholes	2	EACH	1,000.00	2,000
Pump Station		LUMP SUM		10,000
Waterline	1,200	L.F.	35.00	42,000
Fire Hydrants	3	EACH	1,500.00	4,500
				$ 128,100
Buildings				
Restaurant/Boat Store	1,500	S.F.	100.00	150,000
Shower/Rest Rooms	1,700	S.F.	100.00	170,000
Marine Service Station		LUMP SUM		$ 15,000
SUBTOTAL				$ 335,000
Aids to Navigation	1	EACH	15,000.00	15,000
TOTAL ESTIMATED CONSTRUCTION PRICE 1979				$5,715,000
TOTAL ESTIMATED CONSTRUCTION PRICE 1982 @ 10% INFLATION				$7,610,000

BUDGET ESTIMATE

Budget estimates are calculated using the equation:

$$\text{Budget estimate} = E(1.00 + C)(1.00 + F)$$

E is the engineering estimate which are contained in the previous section of this report. C is the contingency factor which is taken as 10%. F is the cost rise factor. This factor is taken as 15% anticipating a one and one-half year time lapse from submittal of the PER to acceptance of construction bids.

	Budget Estimate
Alternate 1	$8,305,200
Alternate 2	$7,900,800
Alternate 3	$7,885,000
Alternate 4	$7,229,500

DESIGN AND ENGINEERING SERVICES

The design and engineering fees are calculated in accordance with the Guidelines for Professional Services of the National Society of Professional Engineers (NSPE). Marina projects are included in Schedule 2. The cost calculated for the recommended alternate Number 3 is $389,000. This includes supplementary services such as survey work and additional soils work needed for final design. See the Financial Feasibility portion of the report for a summation of the total project cost for Alternate 3.

SECTION VI
APPENDICES

APPENDIX A

FINANCIAL FEASIBILITY STUDY

ECONOMIC ENVIRONMENT

Market Areas

The first step in trying to determine how much of a demand there would be for a small boat marina in Ashtabula is to define the areas from which boaters would be attracted to the facility. These areas are referred to as the potential market areas. Several factors have to be considered in delimiting the market area, a few of them being: travel time and highway access; similar facilities and their locations; the type of boater to be served, and so on.

As was stated earlier, highway access is excellent for the proposed site. There is a direct limited-access freeway, State Route 11, linking Ashtabula to Interstate 90. S.R. 11 continues south through the Youngstown-Warren area in Ohio (pop. 208,000), providing a direct freeway route to the city of Ashtabula. Other U.S. and state highways feed into both freeways creating an effective highway network to the proposed site.

One of the primary considerations in defining the market areas is travel time, that is, how much time would a person be willing to spend driving to where his boat is docked. Lake Erie offers opportunities for a wide and attractive variety of recreation. Boating on the lake is different from boating on a small inland lake. The largest inland lake in the area, Pymatuning Reservoir, has a horsepower limit on motors effectively limiting the size of boats using it and the types of uses. Other lakes in the area are considerably smaller and again this limits the available uses. Larger power boats and sailboats are attracted to Lake Erie where the boater can spend an afternoon or a weekend cruising or visiting other ports on the Lake including Canadian ones. The above reasons provide additional incentives in accepting longer travel time to a marina on Lake Erie. People of Northeast

Ohio are willing to travel an hour or more to attend sporting events such as a professional football game in Cleveland which lasts only a few hours. Other attractions such as Cedar Point Amusement Park near Sandusky in western Ohio or Sea World in Aurora, Ohio, draw people from the market areas and represent an hour or more of travel time. Boaters would be willing to spend one hour travelling to the marina to spend one or several days on their boats.

With regard to similar facilities within a reasonable distance from the project site there are three Ohio counties: Cuyahoga, Lake and Ashtabula and one Pennsylvania county, Erie, that border on Lake Erie. Ashtabula County has the least existing dock spaces of these. People living south of these counties must use the facilities located in the above mentioned counties to boat on Lake Erie. A large portion of the existing marinas are in poor condition and do not offer all the facilities planned for the Lake Shore Park Marina.

All of the above factors are considered in delimiting the primary market area. The primary market area is that area for which there is a high probability of attracting boaters to use the marina. An one-hour travel time is used as a reasonable limit for this area. The following counties will define the primary market area: Ashtabula, Lake, Geauga and Trumbull Counties in Ohio and the western half of Crawford County in Pennsylvania. Ashtabula and Lake Counties are included for obvious reasons. People in Lake County can use U.S. Route 20 or I-90 to get to the marina where there is less boating traffic. Geauga County is inland south of Lake County and has only a few smaller lakes available for boating. There are a number of state highways that run north to Interstate 90 providing easy access. Trumbull County is inland south of Ashtabula County. Direct highway access is available via S.R. 11. One larger inland lake, Mosquito Creek Reservoir, with a small number of dock spaces, is located there.

Although Erie County, Pennsylvania borders Ashtabula County on the east, it isn't included in the primary market area because of the great number of existing slips there. A person living in the western portion of Crawford County, Pennsylvania is approximately the same distance from Ashtabula as from Erie, Pennsylvania. A good portion of the users would prefer to berth their boats where there wouldn't be as much marine traffic as in the Erie area. For these reasons, the western half of Crawford County is included in the primary market area.

It is also necessary to delimit the total market area. The total market area is that area for which there is reasonable probability of attracting boaters to use the marina. The primary market area is a part of the total market area. Travel time of two hours is one of the criteria considered. The desire to get away from more crowded areas and clusters of marinas can be factors. More importantly the limited availability and the lesser quality of closer facilities will result in accepting longer travel times. The following Ohio counties compose a portion of the total market area: Ashtabula, Lake, the eastern half of Cuyahoga, Geauga, Portage, Trumbull and Mahoning Counties. The reason for including only the eastern half of Cuyahoga County is the availability of similar marina facilities approximately the same distance west of Cleveland, Ohio. People would rather not drive through large metropolitan areas if they have the choice. The other counties included in addition to those in the primary market are located inland and have mostly small lakes with limited boating. The remainder of the total market area consists of the three Pennsylvania counties bordering Northeast Ohio: Erie, Crawford and Mercer Counties. Reasons were stated for not including Erie County in the primary

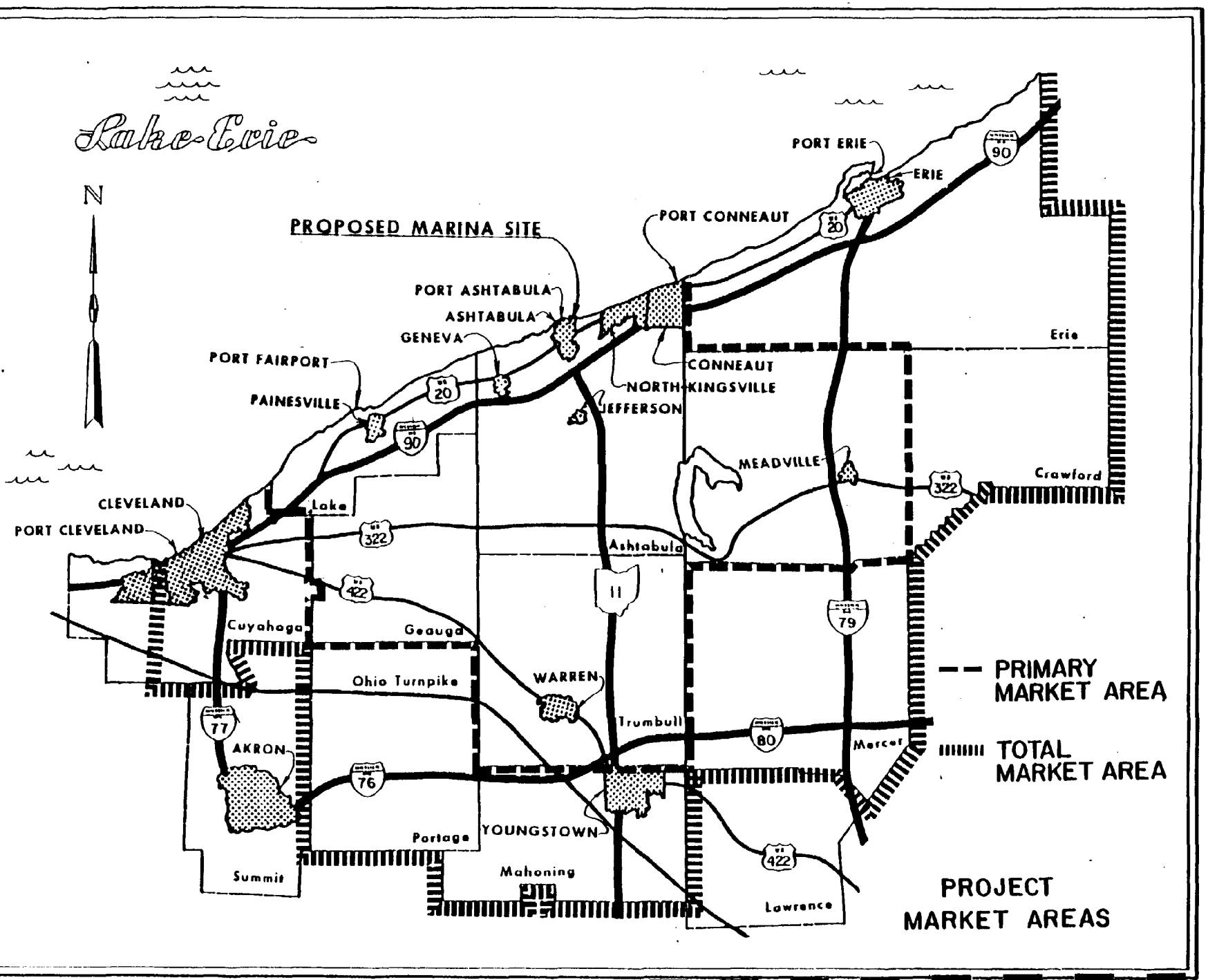

Lake Erie
N
PROPOSED MARINA SITE
PORT ERIE
ERIE
PORT CONNEAUT
PORT ASHTABULA
ASHTABULA
GENEVA
PORT FAIRPORT
PAINESVILLE
CONNEAUT
NORTH KINGSVILLE
JEFFERSON
MEADVILLE
CLEVELAND
PORT CLEVELAND
Lake
Ashtabula
Erie
Crawford
Cuyahoga
Geauga
Ohio Turnpike
WARREN
Trumbull
Mercer
AKRON
Portage
YOUNGSTOWN
Summit
Mahoning
Lawrence
PRIMARY MARKET AREA
TOTAL MARKET AREA
PROJECT MARKET AREAS

FIG A-1

market, but it must be considered part of the total market due to its proximity to the proposed site. Crawford and Mercer Counties are inland and have good highway access to Ashtabula within the suggested travel time, so they are included. See figure A-1 for a map showing the market areas.

Population

Once the market areas are defined it is necessary to look at these areas from a number of different considerations. One of the first things to consider is the gross population of the area. Is it growing or declining? An increasing population represents increasing numbers of potential users. Census data for the population of the primary and the total market areas in 1960, 1970, 1975 and estimated for 1979 is presented in Table A-1. It is noted that two-thirds of the population total for Crawford County is included in the primary market whereas, geographically, the western half of the county was used. The reason for this is that the major portion of the county's population is concentrated around the city of Meadville which is in the western half of the county.

The dramatic population growth experienced in the 60's has slowed. The primary market totals represent a 3.9% increase from 1975 to 1979. This moderate growth rate can reasonably be expected to continue and possibly increase as urban growth expands further into the area. The population of the total market area has declined 0.9% from 1975 to 1979. This is a sign that the area is basically stable at this time. The largest population loss is due to outmigration from the city of Cleveland in Cuyahoga County. Much of the increases experienced in Geauga, Lake and Ashtabula Counties can be attributed to the movement from the city to the suburbs. The population grew in a majority of the counties in the market area.

TABLE A-1

PRIMARY MARKET AREA POPULATION

COUNTY	1979 (1)	1975 (2)	1970 (2)	1960 (3)
ASHTABULA	104,800	101,940	98,237	93,067
GEAUGA	74,000	68,144	62,977	47,573
LAKE	214,700	206,881	197,200	148,700
TRUMBULL	251,500	241,219	232,579	208,526
CRAWFORD, PA. (2/3 Total)	56,700	56,905	54,228	51,971
TOTAL	701,700	675,089	645,221	549,837

TOTAL MARKET AREA POPULATION

COUNTY	1979 (1)	1975 (2)	1970 (2)	1960 (3)
ASHTABULA	104,800	101,940	98,237	93,067
CUYAHOGA (1/2)	765,700	796,307	860,418	823,948
GEAUGA	74,000	68,144	62,977	47,573
LAKE	214,700	206,881	197,200	148,700
MAHONING	295,600	307,339	304,545	300,480
PORTAGE	134,300	132,257	125,868	91,798
TRUMBULL	251,500	241,219	232,579	208,526
CRAWFORD	85,100	85,357	81,342	77,956
ERIE	268,300	273,396	263,654	250,682
MERCER	126,400	127,741	127,225	127,519
	2,320,400	2,340,581	2,354,045	2,170,249

Sources:
1. 1980 Survey of Buying Power
Sales and Marketing Management, July 28, 1980
2. County and City Data Book, 1977
A Statistical Abstract Supplement Bureau of the Census, U.S. Dept. of Commerce
3. Feasibility Survey Report (Technical and Economic) of Proposed Recreational Marina, Ashtabula, Ohio; Rosenstock-Holland-Associates for Area Redevelopment Administration, U.S. Dept. of Commerce, 1965

A more representative basis for indicating potential demand is the number of households. A household, be it a family or a single person, is a more likely unit to represent a potential boat owner. Total numbers of households in 1970 and 1979 for both the primary and the total market areas are given in Table A-2. Increases of 37% and 30%, respectively, are significant. They indicate appreciable growth in potential boat buyers and consequently, marina users. Tables A-3 and A-4 contain information concerning the economic status of households in the market areas. Table A-3 gives the median household incomes for 1960, 1969 and 1979. One of the most significant aspects of this data is that the majority of the counties have consistently been above the state median income level. This would indicate a better than average economic situation. The median incomes in the Pennsylvania counties included in the market area are below the state median. Major urban centers such as Philadelphia and Pittsburgh raise the state median income. Without a large city in this area, this portion of the state could be expected to be below the state level. Table A-4 shows information concerning income levels of households in 1970 and 1979. Sharp increases in the number of households in the $15,000 - $24,999 and over $25,000 categories are noted. A major portion of this growth in income has been consumed by inflation, but some growth in real income must also have occurred. This growth in income represents additional disposable income that can be used on leisure time items such as boats.

Business and Industry

A large portion of the total market area has been rural in land use. With urban sprawl continuing, this is changing somewhat. Lake and Geauga Counties are greatly built up compared to ten years ago. Ashtabula County is also beginning

TABLE A-2

HOUSEHOLDS IN PRIMARY MARKET AREA

COUNTY	1979 (1)	1970 (2)	% CHANGE 1960 - 1970 (3)
ASHTABULA	35,500	25,000	10.2
GEAUGA	22,400	15,400	35.2
LAKE	67,800	49,800	37.5
TRUMBULL	79,800	59,900	17.3
CRAWFORD, PA. (2/3 Total)	19,500	13,900	9.2 (4)
	225,000	164,000	

HOUSEHOLDS IN TOTAL MARKET AREA

COUNTY	1979 (1)	1970 (2)	% CHANGE 1960 - 1970 (3)
ASHTABULA	35,500	25,000	10.2
CUYAHOGA (1/2)	279,600	219,900	11.5
GEAUGA	22,400	15,400	35.2
LAKE	67,800	49,800	37.5
MAHONING	98,200	78,200	8.2
PORTAGE	28,100	28,300	39.4
TRUMBULL	79,800	59,900	17.3
CRAWFORD, PA.	29,200	20,900	9.2 (4)
ERIE, PA.	89,200	65,000	8.8 (4)
MERCER, PA.	41,900	32,200	5.5 (4)
	771,700	594,600	

Sources:
1. 1980 Survey of Buying Power, Sales and Marketing Management July 28, 1980
2. County and City Data Book 1977, A Statistical Abstract Supplement, Bureau of the Census U.S. Dept. of Commerce
3. 1970, General Population Characteristics: Ohio Bureau of the Census U.S. Dept. of Commerce
4. 1970, General Population Characteristics: Pennsylvania Bureau of the Census U.S. Dept. of Commerce

TABLE A-3

INCOME

MEDIAN HOUSEHOLD INCOME

COUNTY	MEDIAN HOUSEHOLD EBI 1979 (1)	MEDIAN FAMILY INCOME 1969 (2)	MEDIAN FAMILY INCOME 1960
ASHTABULA	17,906	9,889	5,651
CUYAHOGA	20,824	11,299	6,943
GEAUGA	23,158	12,411	6,916
LAKE	24,974	11,964	7,146
MAHONING	19,414	10,095	6,076
PORTAGE	19,525	10,989	
TRUMBULL	22,113	10,777	6,391
CRAWFORD	14,605	8,658	5,110
ERIE	17,744	9,362	5,617
MERCER	16,957	9,286	5,872
OHIO	19,274	10,309	6,171
PENNSYLVANIA	18,265	9,554	5,719

Sources: 1. 1980 Survey of Buying Power Sales & Marketing Management, July 28, 1980

2. County and City Data Book 1977, A Statistical Abstract Supplement, Bureau of the Census U.S. Dept. of Commerce

3. Feasibility Survey Report (Technical and Economic) of Proposed Recreational Marina Ashtabula, Ohio, Rosenstock-Holland-Associates for Area Redevelopment Administration, U.S. Dept. of Commerce 1965

Note: EBI is effective buying income. This is personal income including wages, interest, etc., minus taxes, Social Security payments and so on.

TABLE A-4

HOUSEHOLDS WITH VARIOUS INCOMES

1970 (1)

COUNTY	12,000 - 14,999	15,000 - 24,999	25,000 - 49,999	50,000 OR MORE	25,000 OR MORE
ASHTABULA	3,818	3,580	643	98	741
GEAUGA	2,767	4,185	994	127	1,121
LAKE	10,820	11,822	1,826	276	2,102
TRUMBULL	10,652	11,319	1,817	384	2,201
CRAWFORD (2/3)	1,884	1,403	203	41	244
TOTAL PRIMARY MARKET	29,941	32,309	5,483	926	6,409
CUYAHOGA (1/2)	37,222	47,489	11,590	2,935	14,525
MAHONING	11,920	12,569	2,286	455	2,741
PORTAGE	5,230	5,383	1,157	159	1,316
CRAWFORD (1/3)	922	701	101	21	122
ERIE	8,754	8,066	1,734	341	2,075
MERCER	4,110	3,781	704	50	754
TOTAL OTHERS	68,158	77,989	17,572	3,961	21,533
TOTAL MARKET AREA	98,099	110,298	23,055	4,887	27,942

1979-EFFECTIVE BUYING INCOME

COUNTY	10,000 - 14,999	15,000 - 24,999	25,000 & OVER
ASHTABULA	5,110	13,280	8,340
GEAUGA	2,200	7,350	9,770
LAKE	4,880	21,700	33,800
TRUMBULL	7,740	27,100	31,800
CRAWFORD (2/3)	3,970	6,600	2,800
TOTAL PRIMARY MARKET	23,900	76,030	86,510
CUYAHOGA (1/2)	31,900	84,400	103,000
MAHONING	11,100	35,900	29,600
PORTAGE	3,770	10,600	8,400
CRAWFORD (1/3)	1,990	3,300	1,400
ERIE	13,600	32,500	21,800
MERCER	6,370	16,800	8,000
TOTAL-OTHER COUNTIES	68,730	183,500	172,200
TOTAL-TOTAL MARKET AREA	92,630	259,530	258,710

Note: Effective buying income is personal income including wages, interest, etc. minus taxes, Social Security payments and so on.

Sources: 1) 1970 General Population Characteristics:Ohio and 1970 General Population Characteristics: Pennsylvania Bureau of the Census U.S. Dept. of Commerce

2) 1980 Survey of Buying Power Sales & Marketing Management July 28, 1980

to feel the effects. Personal observations in Trumbull County are that there is an increase in housing, retail businesses and light industry/warehousing operations such as are attracted to industrial parks. Similar types of industries are indicated to be growing in Ashtabula County, also. Table A-5 contains information concerning retail sales in the market area. Percentage growth figures for the periods 1967 to 1972 and 1972 to 1979 as well as total sales figures for 1972 and 1979 are given. Again, a large portion of these increases represent inflation in the price of goods. Dramatic increases such as the 220% increase in Geauga County and the 110% increase in Lake County must represent real growth in sales and business accompanying the population growth there.

One occurrence that will have a major economic impact on this area and especially the primary market area is the construction of a new steel mill in Conneaut, Ohio. The United States Steel Corporation has applied for and has been granted a permit by the U.S. Army Corps of Engineers to build this new mill. A number of studies have been done to analyze the impacts the mill will have on the area and to suggest plans to accommodate and shape the accompanying growth. One study done by the Ashtabula County Planning Commission is entitled Alternative Futures for Ashtabula County.[1] Included in this report are population, business and employment projections for various alternate plans including the "no build" situation. The important fact to be gleaned from the report is that economic growth is forecast for the county even without the new mill. Of course, growth would be still greater if the mill is built. Another study prepared by the Office of State Planning and Development of the Commonwealth of Pennsylvania is entitled Northwest Area Profile, A Baseline for the Future.[2] This report deals with Erie and Crawford Counties. Again, growth is

1. Alternative Futures for Ashtabula County, A Study of U.S. Steel Impact Scenarios, Ashtabula County Planning Commission, Jefferson, Ohio, Oct., 1978
2. Northwest Area Profile, A Baseline for the Future, Office of State Planning and Development Commonwealth of Pennsylvania.

TABLE A-5

RETAIL SALES

COUNTY	% CHANGE 1967-1972 (1)	TOTAL 1972 ($1,000)(1)	TOTAL 1979 ($1,000)(2)	% CHANGE 1972-1979
ASHTABULA	41.0	197,232	315,560	60.0
CUYAHOGA	28.3	3,787,391	6,614,342	74.6
GEAUGA	55.7	76,810	247,728	222.
LAKE	67.5	460,264	982,997	113.6
MAHONING	40.1	650,602	1,130,101	73.7
PORTAGE	64.7	214,572	710,591	231
TRUMBULL	58.6	507,536	1,014,286	99.8
CRAWFORD	37.2	168,526	298,927	77.4
ERIE	52.6	600,836	1,029,817	71.4
MERCER	42.7	265,872	487,521	83.4

Sources: 1. County and City Data Book 1977, A Statistical Abstract Supplement, Bureau of the Census, U.S. Dept. of Commerce

2. 1980 Survey of Buying Power, Sales & Marketing Management, July 28, 1980

projected in population, personal income, industry and employment. This is significant since the population has been declining in these counties in recent years, so there is reason to believe this trend will soon be reversed.

Growth in population and growth in business and industry are desirable in a potential market area. It has been demonstrated that both types of growth have been experienced in the marina market areas and are expected to continue in the future.

COMPETITIVE ENVIRONMENT

As was mentioned earlier, one must consider similar facilities and their locations in proposing a project such as a marina. Factors that can come into play in addition to location are availability, quality of the facilities, i.e. how well a marina is maintained, and the kind of facilities offered in the marina such as water, electricity, gasoline and so on.

In reference to the boating industry itself, sales of boats, motors, and accessories rose 5.7% to $3.63 billion in 1979[3]. The boating industry is cyclic, being quickly affected by the general economic atmosphere. Since a boat or motor are convenience types of items, people will forego major purchases in tight money times. Rising fuel prices have dampened enthusiasm for large outboard motors. Once people feel secure and reassured that fuel will be available and fuel prices have leveled off, they will be less hesitant about powerboats in general. These are probably part of the reason for the 2% decline in boat registrations in Ohio from 1977 to 1979. It is anticipated that the number of boaters will start to grow again in both Ohio and Pennsylvania with the increasing number of households. It should be noted that sailboat sales have been increasing in recent years. This trend can be expected to continue with the increasing concern for saving energy and saving money on fuel costs. This would tend to attract more people to Lake Erie since it is the major area for sailing activity in the market area.

The existing number of slips available and their geographic distribution are important considerations. Following is a listing of the marinas on Lake Erie within the total market area, see Table A-6. The name of each facility and the number of slips in it are listed and totals are computed for the four counties included. Those totals are: 773 for Ashtabula County, 1,847 for Lake County, 1,633 in the eastern half of

3 Leisure Time Basic Analysis, Standard & Poor's Industry Surveys August 14, 1980 (Section 2)

TABLE A-6

COMPETITIVE MARINAS - 1979

ASHTABULA COUNTY

NAME	NUMBER OF SLIPS
City of Conneaut	150
Conneaut Boat Club	58
Snug Harbor Marina	20
Sutherland Marina	25
Ashtabula Yacht Club, Inc.	110
Jack's Marine	200
Riverside Yacht Club, Inc.	30
Redbrook Boat Club	150
Brockway Marine	30
Total	773

LAKE COUNTY

NAME	NUMBER OF SLIPS
Encounter Yacht Sailing Center	30
Winfield Marine	15
Douglass & McCleod	20
Rutherfords Landing	50
Grand River Yacht Club	*
Fairport Yacht Club	135
Grand Harbor Hacht Sales	132
Western Reserve Yacht Club	50
Mentor's Lagoon Marina	650
Mentor Harbor Yacht Club	160
Chagrin Harbor Beach Marina	23
Chagrin Lagoons Yacht Club	150
West Channel Yacht Club	70
Hi-Skipper Marina	80
Lake Shore Marina	85
Chagrin River Yacht Club	*
Bolten Marine Sales, Inc.	165
M-K	32
Total	1,847

* Information not available.

TABLE A-6 (Continued)

COMPETITIVE MARINAS - 1979

CUYAHOGA COUNTY (EASTERN HALF)

NAME	NUMBER OF SLIPS
Wildwood Yacht Club, Inc.	60
Northeast Yacht Club	180
East 55th Street Marina	292
Gordon Shore Boat Club	*
Forest City Yacht Club	135
Lakeside Yacht Club	200
Edgewater Park Marina	306
Edgewater Yacht Club	375
Cuyahoga Boat & Engine Co., Inc.	85
Total	1,633

ERIE COUNTY, PENNSYLVANIA

NAME	NUMBER OF SLIPS
Freeport Yacht Club	---
Presque Isle Lagoon Boat Livery	55
Bayshore Marine	13
Lund Boat Works, Inc.	---
R.D. McAllister & Son, Ltd.	95
Brockway Marine Erie, Inc.	75
East & West Canal Basin	33
Gem City Marina	35
Sailyard	24
Presque Isle Yacht Club	89
Erie Marine	46
Chestnut Street Marina	62
Polish Yacht Club	*
Commodore Perry Yacht Club	78
Presque Isle State Park	498
Furncliff Beach Association	6
Erie Yacht Club	360
Sommerheim Moorings	---
Walnut Creek	75
Total	1,544

* Information not available.

Source: Boating Facilities Inventory for Lakes Erie and Ontario and Connecting Waterways, U.S. Army Corps of Engineers, Buffalo District, Buffalo, N.Y. 14207, December 18, 1979.

Cuyahoga County and 1,544 in Erie County, Pennsylvania. It can be seen that Ashtabula County has the fewest existing spaces of the four. Its shoreline is comparable in length to that of Lake and Erie Counties so the boating density must be lower also. This is an attractive feature to users. Rather than add more spaces where it is already quite crowded, it is reasonable to build in an area where there are fewer slips at present. Since the accessibility is comparable to the other marinas, the proposed marina will compete easily.

Slip availability is a major concern in this area. A report, A Study of Lake Erie Marine Recreation in Ohio[4], was prepared for the Lake Erie Marine Trades Association in 1977. This report (hereafter referred to as the "LEMTA report") surveyed the marinas, collecting information on the number and size of slips, occupancy and other facilities offered. One of their findings was that, in general, over 95% of all the slips available were rented for the entire season. For the three Ohio counties within the market area, the occupancy rate for various size classifications was essentially 100% except for the 30'-40' class in Lake County, which was 63% occupied. This report also mentioned many marina operators stating that they had long waiting lists for dock spaces and were renting spaces normally reserved for repairs or other uses for the season. In conversations with local Ashtabula marina owners and boat dealers, Don Sutherland of Sutherland Marine and Grant Brockway of Brockway Marine, both gentlemen stated that there were one-year or longer waiting lists at all the local marinas confirming the above report's findings. Mr. Brockway runs a 25 slip marina in Ashtabula in conjunction with his boat dealership. He stated that a major obstacle to purchasing a boat often is the lack of a place to dock it. Despite the fact that both gentlemen are

4 A Study of Lake Erie Marine Recreation in Ohio Natural Resources, Ohio Agricultural Research and Development Center & School of Natural Resources, Ohio State University for Lake Erie Marine Trades Association, 1977

involved in dock rentals themselves, they stated that there definitely is a need for additional dockspace in the Ashtabula area.

The other factor mentioned was the quality and types of facilities offered by marinas. Some of the existing facilities in the market area are slightly run down and don't offer one or the other convenience such as water for each berth or having a gasoline pump in the marina. One of the reasons for including all the modern facilities associated with marinas is to make this marina as attractive and convenient as possible.

At the present time, a 360-slip marina is planned for Geneva State Park in Geneva-on-the-Lake, Ohio. Geneva-on-the-Lake is approximately 12 miles west of Ashtabula Harbor near the border between Ashtabula and Lake Counties. This marina is a joint effort by the Ohio Department of Natural Resources and the Buffalo District of the U.S. Army Corps of Engineers. The project is presently progressing to the final design stage. This future facility will be taken into account in the demand analysis.

DEMAND ANALYSIS

With all of the previous discussion as background, a method will be formulated to determine how much of a demand there is for dock spaces and correspondingly, is it possible to attract enough boaters to fill the marina in Ashtabula.

A number of studies have been done, all of which forecast the need for additional slips in the Ashtabula area. The number of slips at present do not meet these demand forecasts. One of these studies, Feasibility Survey Report Technical and Economic) of Proposed Recreational Marina Ashtabula, Ohio[5], done

5 Feasibility Survey Report (Technical and Economic) of Proposed Marina Ashtabula, Ohio Rosenstock-Holland-Associates for Area Redevelopment Administration, U.S. Dept. of Commerce, 1965.

in 1965, predicted a large demand for dock spaces - 2,444 needed by 1967 in Ashtabula County. (There were 300 dock spaces at this time). The population of the area was growing rapidly at that time and formed part of the basis for the large demand forecast. The report for the proposed marina at Geneva-on-the-Lake[6] (hereafter referred to as the Geneva report) contained a demand analysis. This analysis concluded that only 490 additional slips would be needed in Ashtabula County in 1990. Although the volumes of demand differ considerably, they both forecast the need for additional spaces.

A good place to start in trying to look at the present demand is to see what has happened in the past. The Rosenstock-Holland Feasibility Study[5] stated that there were 300 permanent dock spaces available in Ashtabula County in 1965. As was listed previously (Table A-6), there are 770 spaces in 1979 with essentially 100% occupancy. This represents a 260% growth over 14 years in available slips with no problems in vacancies. The 770 present spaces is far short of the 2,444 slip demand predicted for 1967. Similarly in Lake County, there were 1,235 berths in 1965. The 1979 total is 1,850 with no information from a couple marinas. This represents at least 150% growth. It can be seen that the two Lake Erie counties in the primary market area have experienced significant growth in marina facilities and these facilities are being fully utilized.

Due to the great variety of the types of recreation and boating available, there is considerable boater pressure along the Ohio shore of Lake Erie. According to the LEMTA report, there was a total 18,500 dock spaces available on Lake Erie in Ohio in 1977. 70,200 boats listed Lake Erie as their preferred waters in that year[7]. Thus, there were 3.79 boats per existing dock

6 Stage 2 Document for Reformulation Phase I General Design Memorandum Geneva-on-the-Lake, Ohio Small Boat Harbor U.S. Army Corps of Engineers, Buffalo District, Buffalo, N.Y. April, 1980

7 Registration statistics Division of Watercraft, Ohio Department of Natural Resources

space on Lake Erie. It is reasonable to assume that 40% of those preferring Lake Erie would want a dock space if available.

40% of 70,200 = 28,000 want a slip

$$\frac{28{,}000 \text{ boats}}{18{,}500 \text{ available slips}} = 1.52 \text{ boats/available slip}$$

This results in about 1-1/2 boats per existing space. In other words, there is a shortage of slips along the Ohio shore as a whole.

It is useful to know what percentage of the registered boats prefer Lake Erie in Ohio. This was calculated for a number of different years and remained consistently at a little more than 26%. Although data isn't available for the Pennsylvania counties, it is assumed that they are similar to the Ohio counties in the market area since their geographical setting is similar. Of course, it is reasonable to assume that the majority of the boaters preferring Lake Erie are located in the northern portion of the state. Therefore, the percentage preferring the Lake in both the primary and total market areas would be greater than 26% and, in fact, the percentage would get larger the closer one got to the Lake.

For the sake of simplicity, the primary market area will be referred to as Zone 1. The additional counties that make up the remainder of the total market area i.e. the eastern half of Cuyahoga County, Portage and Mahoning Counties in Ohio and Erie, Mercer, and the eastern half of Crawford Counties in Pennsylvania, will be called Zone 2.

Demand From Zone 1

In calculating the demand, figures for sailboats and those for powerboats shall be kept separate. The main reason for this is that Lake Erie is the major source for sailing whereas powerboats may more easily use other inland lakes. Data for the number of sailboats and inboard and outboard powerboats

TABLE A-7

1979 REGISTRATION TOTALS

ACCORDING TO BOAT TYPE

COUNTY	OUTBOARD	INBOARD	TOTAL POWERBOAT	SAILBOAT
Ashtabula	1,768	333	2,101	137
Geauga	792	238	1,030	169
Lake	2,531	1,020	3,551	482
Trumbull	4,145	839	4,984	329
Crawford, Pa. (1) (2/3 total)	2,082	147	2,229	18
Total in Zone 1	11,318	2,577	13,895	1,135
Cuyahoga (1/2)	5,041	2,663	7,704	1,251
Mahoning	3,268	825	4,093	291
Portage	2,081	421	2,502	230
Crawford (1/3) (1)	1,041	74	1,115	9
Erie (1)	5,461	1,153	6,614	261
Mercer (1)	3,492	340	3,832	62
Total in Zone 2	20,384	5,476	25,860	2,104
Total in Total Market Area	31,702	8,053	39,755	3,239

Sources: Division of Watercraft, Ohio Department of Natural Resources

1. Boat Registration Division, Pennsylvania Fish Commission

TABLE A-8

BOAT REGISTRATIONS IN PRIMARY MARKET AREA

COUNTY	1973	1976	1979
Ashtabula	2,652	2,842	2,921
Geauga	1,907	2,070	2,096
Lake	5,142	5,863	5,691
Trumbull	5,951	7,006	7,037
Crawford, Pa. (2/3 total)	2,121(2)	2,394(2)	2,333(1)
Total	17,773	20,175	20,078

BOAT REGISTRATIONS IN TOTAL MARKET AREA

COUNTY	1973	1976	1979
Ashtabula	2,652	2,842	2,921
Cuyahoga (1/2)	11,494	12,759	11,638
Geauga	1,907	2,070	2,096
Lake	5,142	5,863	5,691
Mahoning	4,499	5,363	5,402
Portage	3,815	4,108	4,205
Trumbull	5,951	7,006	7,037
Crawford	3,182 (2)	3,591 (2)	3,499 (1)
Erie	6,356 (2)	7,172 (2)	6,989 (1)
Mercer	3,604 (2)	4,067 (2)	3,963 (1)
Total	48,602	54,841	53,441

Sources: Division of Watercraft, Ohio Department of Natural Resources.

1. Boat Registration Division, Pennsylvania Fish Commission

2. Estimated from 1979 data

in Zones 1 and 2 is given in Table A-7.

The first step is to designate the portion of the boats from Zone 1 that would be attracted to Lake Erie. The percentages to be used should be considerably higher the 26% for the entire state due to the proximity to the Lake. In the Geneva report it is assumed that 85% of the sailboats and 60% of the permanently docked and 54% of the trailered powerboats are attracted to Lake Erie. 85% is used here for sailboats since they are strongly attracted to the Lake. 54% is used in our case for powerboats since Zone 1 is larger when compared to the primary market area used in the Geneva report.

Boats preferring Lake Erie

Sailboats	.85 x 1,130	=	960
Powerboats	.54 x 13,900	=	7,510
			8,470

The next step is to calculate the number of the above boats which are larger than 16 feet in length. This is used as a criteria for designating trailered and permanently docked boats. Looking at Ohio boat registration information, about 33% of the sailboats and 42% of the powerboats are larger than 16 feet. Since Zone 1 is fairly close to the Lake, the percentage of large craft would be higher. Accordingly, it is assumed that 43% of the above sailboats and 55% of the powerboats are larger than 16 feet.

Boats preferring Lake Erie larger than 16'

Sailboats	.43 x 960	=	410
Powerboats	.55 x 7,510	=	4,130
			4,540

Finally it is necessary to designate how many of these larger boats would want a permanent dock space. Considering the problems involved in trailering and launching larger boats, it is assumed that 90% of the sailboats and 65% of the powerboats would want a dock space.

Boats wanting a dock space on Lake Erie

Sailboats	.90	x	410 =	370
Powerboats	.65	x	4,130 =	2,680
				3,050

There is demand for 3,050 permanent dock spaces generated by Zone 1.

Demand From Zone 2

The procedure followed for Zone 2 is similar to that for Zone 1. Proportioning of boats is slightly different to reflect the fact that some of the counties in Zone 2 are further from Lake Erie than those in Zone 1. It should be remembered that the eastern half of Cuyahoga County and Erie County, Pa., both bordering on Lake Erie, are included in this zone so this would keep the percentages preferring the Lake higher than statewide figures. Accordingly, the percentages used for preferring the Lake are 75% for sailboats and 40% for powerboats.

Boats preferring Lake Erie

Sailboats	.75	x	2,100	=	1,580
Powerboats	.40	x	25,860	=	10,340
					11,920

For the reasons stated above, the percentages of boats larger than 16 feet lie between those for Zone 1 and the statewide figures. Therefore the percentages are lowered to 37% for sailboats and 45% for powerboats.

Boats preferring Lake Erie larger than 16'

Sailboats	.37	x	1,580	=	580
Powerboats	.45	x	10,340	=	4,650
					5,230

Although these boaters are further from the marina and Lake Erie in general, this would work in favor of having a permanent slip rather than having to trailer a boat. Someone who has a longer drive would probably prefer not having to haul a large boat to the Lake each time he wanted to use it. For this reason, the percentages used for permanent dock spaces are the same as those for Zone 1.

Boats wanting a dock space on Lake Erie

Sailboats	.90	x	580	=	520
Powerboats	.65	x	4,650	=	3,020
					3,540

There is demand for 3,540 permanent dock spaces on Lake Erie from Zone 2.

Demand in Zone 1

In order to get a final demand total for the primary market area (Zone 1), the above totals are further modified. This demand consists of the boaters from within Zone 1 who want a slip in Zone 1 and those from Zone 2 who want a slip in Zone 1. The two factors that are considered in making the modifications are travel time and dock availability.

The New York State Parks and Recreation Department developed a travel time versus percent participation curve for boating (Figure D1 in the Geneva report). The values obtained from the curve are increased for two reasons. The first is that travel time has been partially taken into account in the assumptions made for the previous demand calculations. The second reason is that this curve doesn't take into account the unique character of Lake Erie boating as was discussed earlier. The average travel time for Zone 1 is taken as 40 minutes which results in a 70% participation rate from the curve. 90% will be used here. The average travel time for Zone 2 is about 1-1/2 hours, giving a 23% participation rate. The factor used is modified to 28%.

The second criteria to be considered is dock availability. The existing facilities and their capacities have been listed in Table A-6. The total number of existing slips in Ashtabula County is 770. If this project with its proposed 400 slips and the Geneva-on-the-Lake Small Boat Harbor with 360 slips are built, the total number of slips available would be 1,530. The total listed for Lake County is 1,850 with two yacht clubs not providing information. For this reason, an estimated total of 1,920 spaces is used for Lake County.

Total available slips in Zone 1

$$1,530 + 1,920 = 3,450$$

For Zone 2 the figures are: 1,630 slips in the eastern half of Cuyahoga County and 1,540 slips in Erie County, Pennsylvania. The total for Zone 2 is 3,170 spaces.

Total slips available in the total market area

$$3,450 + 3,170 = 6,620 \text{ slips}$$

The portion of the spaces in Zone 1 as compared to the total market area is 52%.

$$\frac{3,450 \text{ in Zone 1}}{6,620 \text{ in total market}} \times 100 = 52\%$$

The demand being calculated is for Zone 1 so the availability factor is 1.00. The .52 factor calculated is used for Zone 2.

Demand for slips in Zone 1

from Zone 1	3,050(1.00)(.90)	=	2,750
from Zone 2	3,540(.52)(.28)	=	520
			3,270

This demand for the primary market area must be proportioned to the two counties involved, Ashtabula and Lake Counties. Again availability is used as the criteria.

$$\frac{1,530 \text{ in Ashtabula County}}{3,450 \text{ in Primary Market}} = .44$$

Demand for slips in Ashtabula County

$$.44 \times 3,270 = 1,440 \text{ slips}$$

With 770 existing docks in 1979, an additional 670 are needed. This is less than the combined capacity of the two proposed marinas. In general, it can be expected that the number of boats will grow in the future. The law of supply and demand plays a role also. A major concern of a buyer of a large boat is having a place to dock it. If he hears that there are two-year waiting lists at all the marinas, he is much less likely to make a purchase than if he knew he could get a dock space in a marina. In this sense, a slight over-supply of spaces would be exhausted in a few years.

The 400 spaces in Lake Shore Park Marina make up 52% of the new spaces to be provided. Correspondingly proportioning demand, 348 slips will be filled.

If demand grew at 2% annually for 3 years, the total additional spaces needed would be about 760 or the capacity of the two proposed marinas. Thus, both could be expected to reach capacity in a minimal amount of time.

A couple of factors that could influence boat owners in Ashtabula should be mentioned. The LEMTA report states that 44% of the marinas in Ashtabula County are private clubs. One must be interested in being a member of the club rather than simply renting a dock space. Lake Shore Park Marina will be a municipal marina run by the Township Park Commission.

The other factor to be mentioned is the location of the existing marinas in the city of Ashtabula. The situation with the lift bridges has been described in the discussion of water access. These marinas represent fifty-one percent of the existing dock spaces in Ashtabula County. According to the LEMTA report, forty-two percent of the dock spaces in Ashtabula County are for boats larger than 30'. The proposed marina would be very attractive to these owners and a considerable number of transfers from the existing marinas could be expected. The following calculation is done to get an idea of the number of possible transfers.

There are 395 boats docked on the Ashtabula River, assuming 100% occupancy.

42% of the boats are larger than 30'

.42 x 395 = 166 boats

If as few as one-third of these large craft would transfer, this would be 55 boats, a significant number. Other Ashtabula residents may berth their boats at other marinas in order to avoid the problem with the bridges and would be interested in transferring back to a marina closer to home.

The result of this analysis is that presently, there is demand for 670 additional slips in Ashtabula County. These results are slightly larger than

those of the Geneva report which forecast 490 additional spaces needed in 1990. One of the main reasons for this is our selection of a larger primary market area. Other points of difference have been noted in the development of the demand calculations. With as little as 3% growth in boating, it should be possible for both Lake Shore Park Marina and Geneva-on-the-Lake Small Boat Harbor to reach capacity within less than 3 years.

FINANCIAL FEASIBILITY

Once the demand for a marina has been demonstrated, it is necessary to determine whether it is possible for the marina to pay for itself. In this case, it must be determined if the project can repay the loan obtained to build it and under what terms this can be done. The repayment ability is determined by examining the total costs and the revenues.

The costs are composed of the following: the project construction cost, architectural and engineering fees, contingencies, interest on the loan and annual operating expenses. The construction costs and architectural fees have been developed elsewhere in this report. Total project costs, that is, architectural fees, administrative cost, construction cost and contingencies, are shown in Table A-9 based upon the recommended alternate, Alternate 3.

Revenues come from the various services of the marina. These are: the rental of the slips, leasing the space for a marine store and a restaurant in the main marina building, also leasing the boat repair and service building, fees for parking and fuel sales. Following is a discussion of the sources of income.

The primary source of income is the seasonal rental of the slips. In the final design, there will be a variety of pier lengths in order to accommodate the various size boats. The usual method of computing rental fees is based on "X" dollars per foot of boat length. In this report, a 25 foot boat has been used as the standard unit. The rental fee used is $625 per slip or $25 per foot. The going rate at the present time for a marina with similar modern conveniences is presently $20 per foot in Ashtabula. The $25 per foot is estimated to be the rate in approximately two years from now so that our

TABLE A-9

PROJECT COST FOR ALTERNATE 3

Administrative Cost		
CEIP (d)(1) loan and guarantee		$32,700
Architectural fees		
Estimate from 6/80	$389,000	
+1 year delay @ 10%	$ 38,900	
	$427,900	
-308 (c)(1) grant	$-16,000	
	$411,900	$411,900
Construction cost		
Estimate from 6/80	$6,233,000	
+15% for 1.5 year delay	$ 935,000	
	$7,168,000	$7,168,000
		$7,612,600
Required Contingency factor (10%)		$ 761,300
Total Project Cost		$8,373,900
Annual Payment for 5% Interest & 30 year term		$ 544,700

proposed rate becomes competitive. It must be kept in mind that all the modern conveniences are provided at Lake Shore Park Marina. In addition, this fee includes winter storage at the marina and launching and haul-out plus one mid-season haul-out if needed. From the demand analysis, 348 berths will be occupied during the first year of operation. Full capacity is 403 permanent (seasonal) slips with 5 berths set aside as transient docks. The charge for a transient dock space is $12 per day. Providing day dock spaces could prove to be a valuable asset since there are few such berths available in Ashtabula and Lake Counties at present.

Two types of parking fees are charged for marina parking. The first type is a yearly permit intended for slip owners as preferred customers which costs $25 per year. 376 parking spaces can be used in this manner. The twenty remaining spaces are reserved for daily customers at a charge of $1 per entry. On other than peak days, more than 20 day customers can be admitted since the parking lot won't be full. The main drawing point for day customers is expected to be the marina restaurant.

Another source of revenue is the leasing of the space in the building included in the project. A marine store and a restaurant are planned for the main marina building. This is a prime location for both of these businesses. Restaurants with a view of Lake Erie are very popular in Northeast Ohio. For a boat store there are over 400 potential customers within walking distance of the store. Why should they go elsewhere if they discover they need something for the boat? The expected income from the rental of the space for these two businesses is $4,000 per month. It is possible that other types of rental space would be provided with the other alternates, resulting in additional revenues.

The final source of income is the lease with an oil company to provide fuel in the marina. The expected income from gas sales is set at 12¢ per gallon. This includes profit on the gas sales and the rental fee and is commensurate with current rates.

Annual operating costs must also be examined. Included among these are payroll, administrative and general costs, energy costs, and repairs and maintenance. Provision must also be made for insurance costs and some type of reserve fund should be set aside in case of unforseen expenses. The largest of these costs is the payroll which is calculated on the basis of six year-round employees. The actual work force would vary depending on the time of year and would be made up of some park personnel who would help out in the marina when it became necessary. The other costs are taken as percentages of the rental income since much of the need for these expenditures arises from the level of use.

Table A-10 shows revenues and operating costs for the first, fourth and fifteenth years of operation. By the fourth year full occupancy should be achieved as was mentioned in the demand study. The fifteenth year is the median year for a thirty-year loan so it represents the average annual income available over the term of the loan. Annual operating expenses are deducted from the annual income to obtain the amount available to repay the loan. A seven percent annual rise in the rental fees and employee payroll is used in projecting future revenues and costs. This is considerably below the inflation rate of recent years and represents at least a break-even situation for buying power rather than a loss for the consumer. In the fifteenth year the amount available to pay the loan, $546,000 meets the annual payment of $545,000 for a 5%, 30-year loan of $8.4 million. Some type of arrangement would have to be made to allow the Park Commission to repay the loan in

TABLE A-10

ANNUAL REVENUES AND COSTS

1982, 1986, 1997

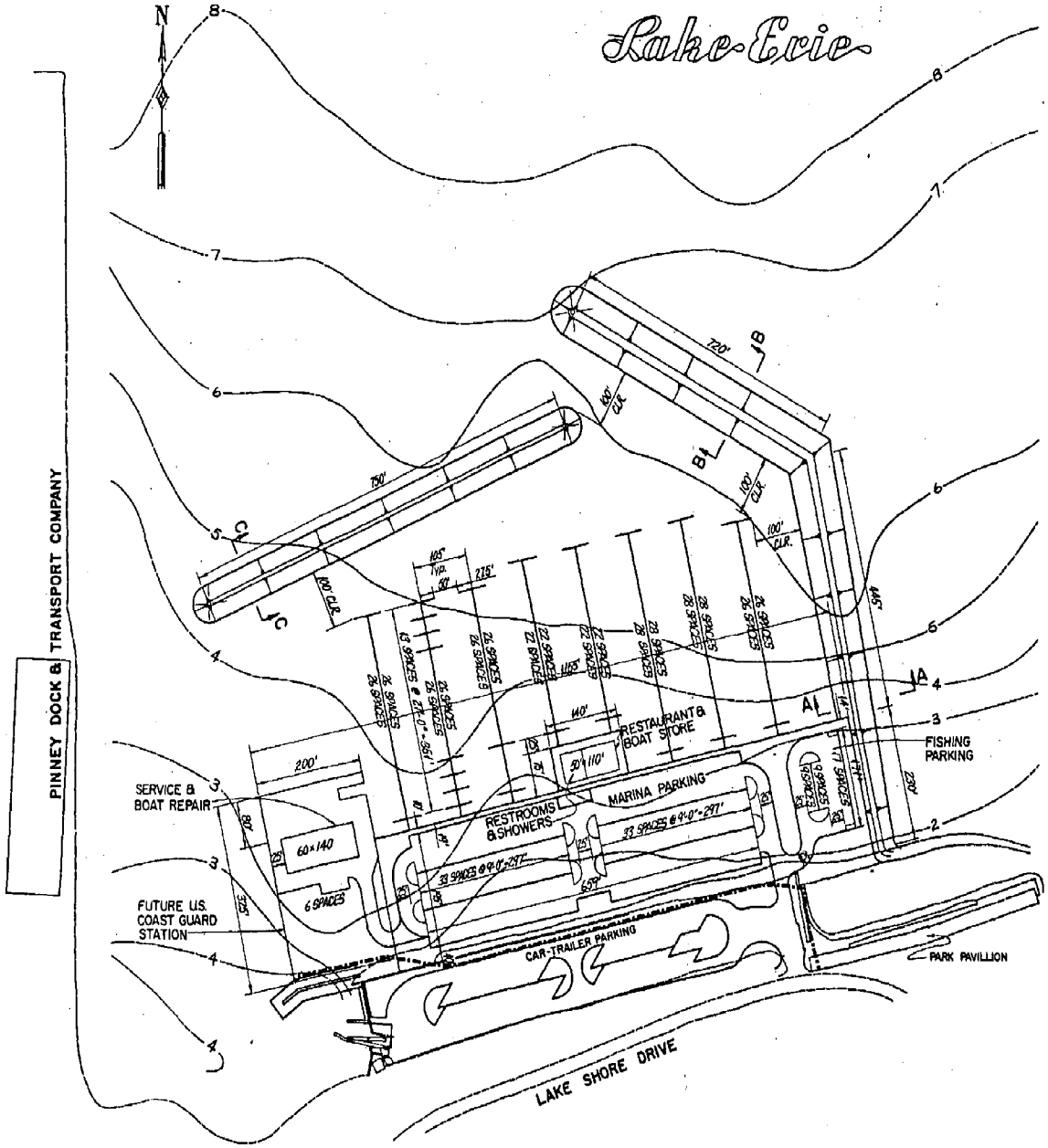
	1982	1986	1997
Occupancy	86%	100%	100%
Revenue			
1) Slip rental			
Season	217,500	330,500	695,000
Transient	2,200	2,900	6,400
2) Building leases			
Boat store & restaurant	48,000	48,000	120,000
3) Parking Fees			
Season permit	8,700	11,300	26,300
General-day	3,600	5,400	10,800
	$280,000	$398,100	$858,500
4) Fuel sales	8,400	9,700	15,000
	$288,400	$407,800	$873,500
OPERATING EXPENSES			
1) Payroll & related expenses	$62,400	$81,100	$171,600
2) Administrative & general	8,400	11,900	25,800
3) Energy costs	14,000	19,900	42,900
4) Repairs & maintenance	5,600	8,000	17,200
5) Property insurance	30,000	35,000	60,000
6) Reserve for replacement	5,000	5,000	10,000
	$125,400	$160,900	$327,500
Amount available for loan payment	$163,000	$246,900	$546,000

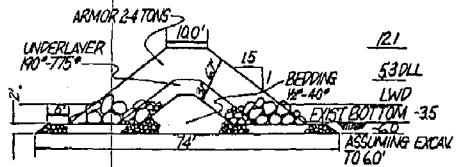
graduated payments as the marina income grows.

Additional economic benefits will accrue due to the construction of the marina. In this financial analysis it was mentioned that the payroll costs were calculated on the basis of six year-round jobs. In addition to these jobs, more jobs will be created for the repair operation, marine store and restaurant. It is anticipated that people will be attracted to spend one or several days at the marina on weekends and for vacations. This influx of people will increase business for retail establishments in Ashtabula. These additional economic benefits cannot be pinpointed but definitely will occur.

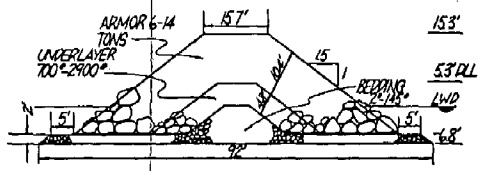
APPENDIX B

ILLUSTRATIONS





SECTION A-A



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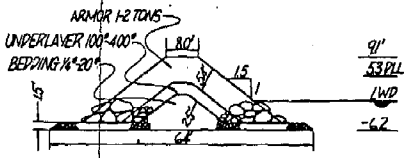

SECTION C-C

ALTERNATE I DATA	
NUMBER OF BERTHS	408
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/FISHING	35
CAR-TRAILER	
RESTAURANT AREA	2,000 S.F.
FACILITIES AREA	3,500 S.F.
MADE LAND AREA	6.7 AC.
BREAKWATER LENGTH	2,145 FT.
BULKHEAD LENGTH	1,860 FT.
VOLUME OF FILL	88,100 C.Y.
PAVEMENT AREA	18,140 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$ 6,557,400

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF •——•——• LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE I

SCALE HOR. - 1"=100' VERT. -
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DESIGNED BY
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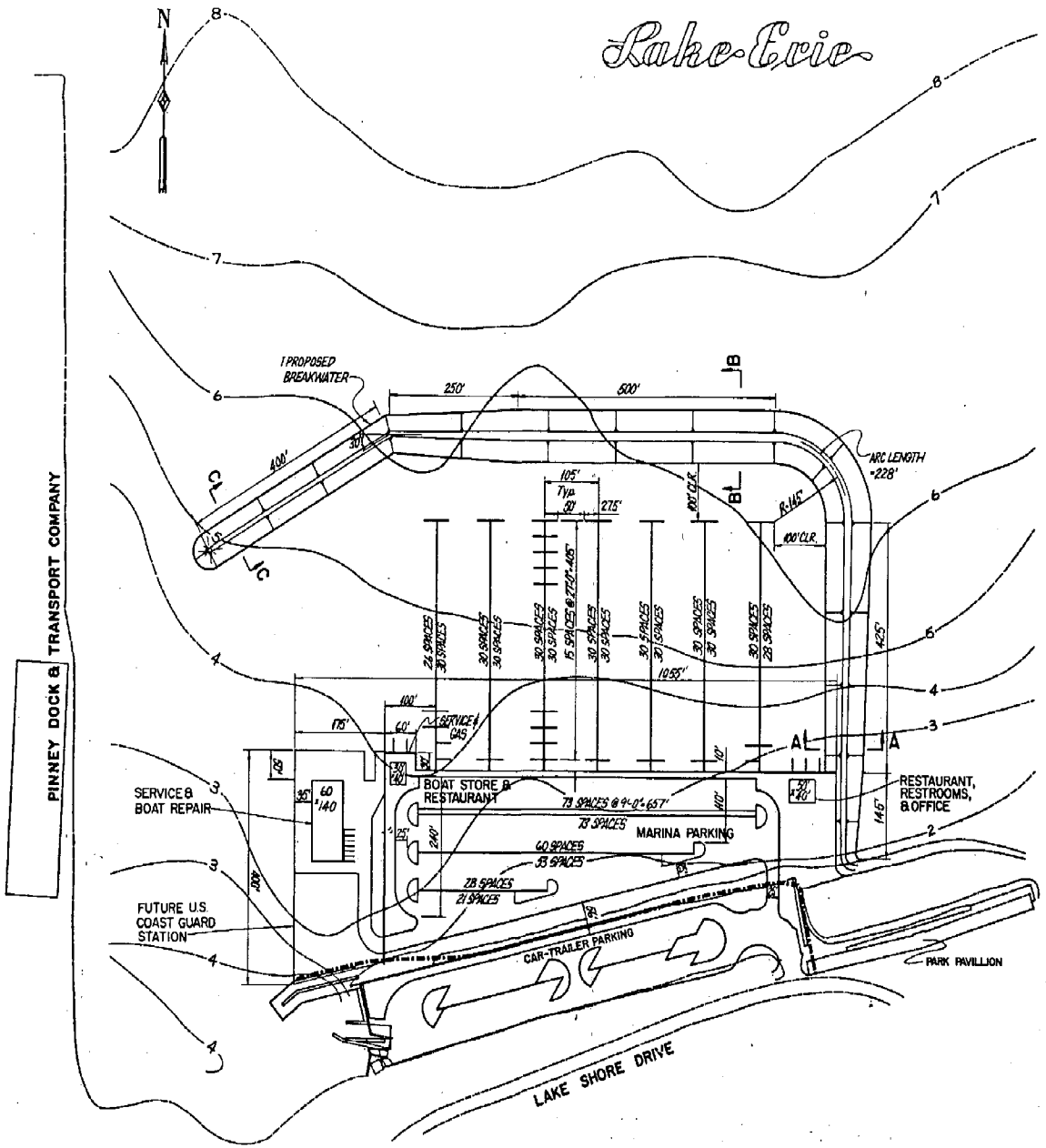

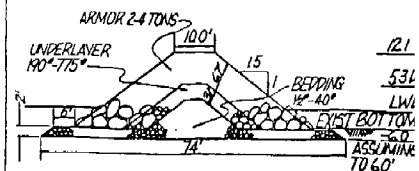

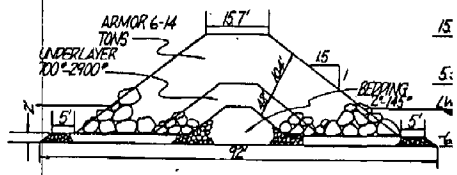

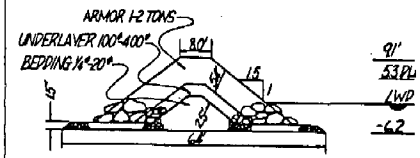

ALTERNATE 2 DATA	
NUMBER OF BERTHS	414
NUMBER OF PARKING SPACES:-	
MARINA	381
RESTAURANT/FISHING	
CAR-TRAILER	
RESTAURANT AREA	1,500 S.F.
FACILITIES AREA	1,700 S.F.
MADE LAND AREA	6.7 AC.
BREAKWATER LENGTH	1,950 FT.
BULKHEAD LENGTH	1,640 FT.
VOLUME OF FILL	85,700 C.Y.
PAVEMENT AREA	16,940 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$ 6,245,700

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF ----- LINE BY OTHERS

WOODRUFF, IN
CONSULTING ENG
CLEVELAND, OHIO

LAKE SHORE PARK MA

ALTERNATE

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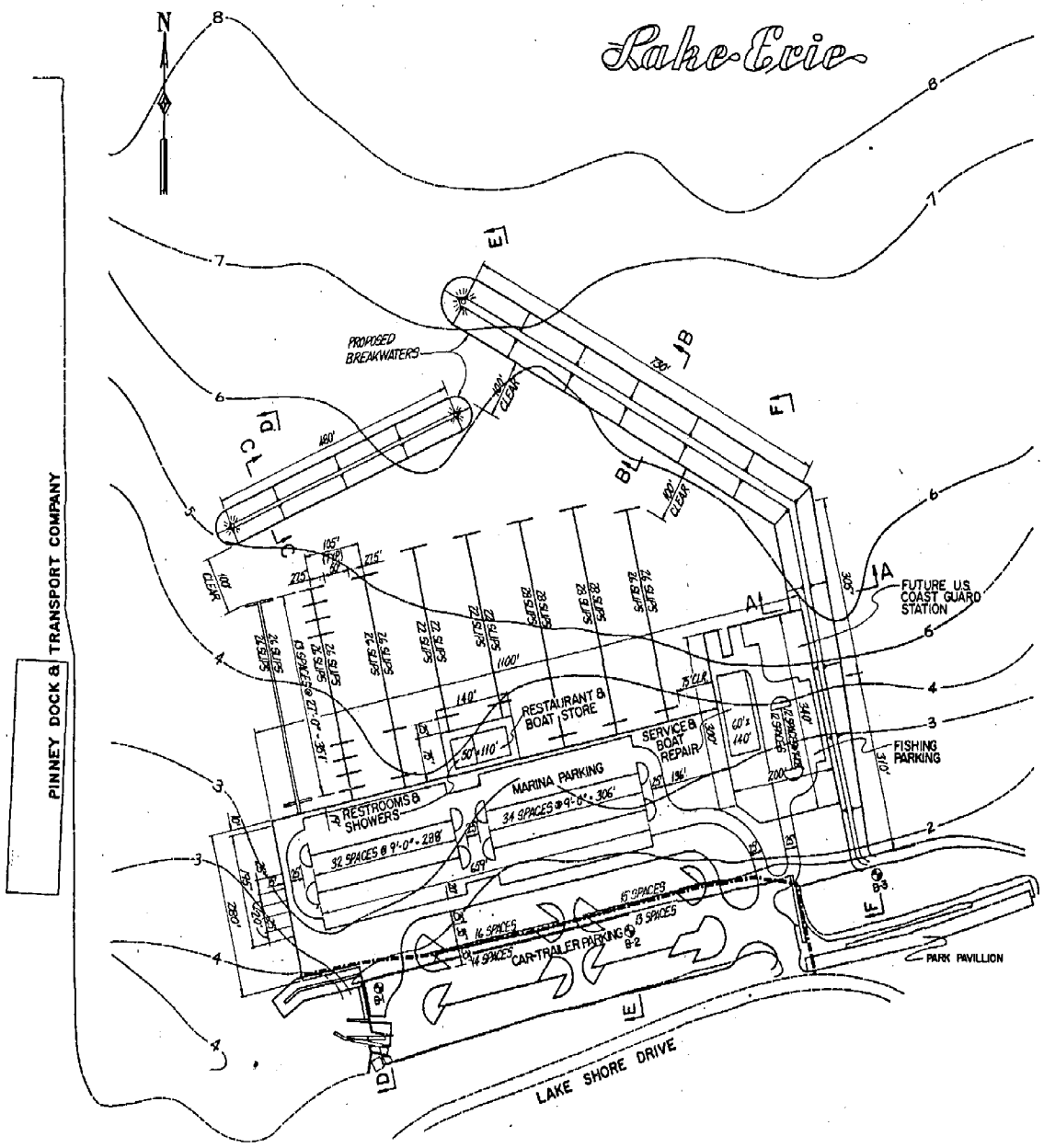
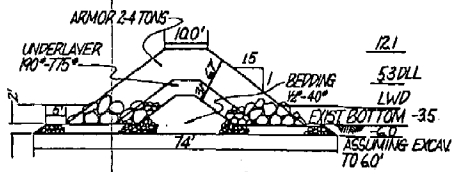
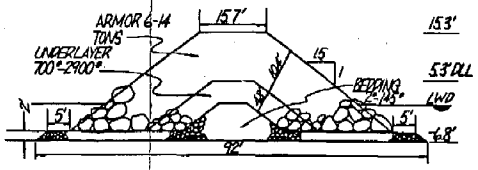




SECTION A-A



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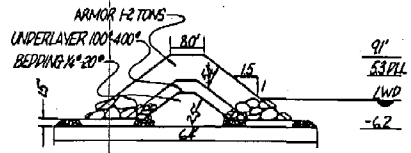

SECTION C-C

ALTERNATE 3 DATA	
NUMBER OF BERTHS	408
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/ FISHING	40
CAR-TRAILER	58
RESTAURANT AREA	2,000 S.F.
FACILITIES AREA	3,500 S.F.
MADE LAND AREA	7.9 AC.
BREAKWATER LENGTH	1,825 FT.
BULKHEAD LENGTH	1,940 FT.
VOLUME OF FILL	104,000 C.Y.
PAVEMENT AREA	22,560 S.Y.
ESTIMATED CONSTRUCTION-	
COST 1979	$6,233,200

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF ----- LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE 3

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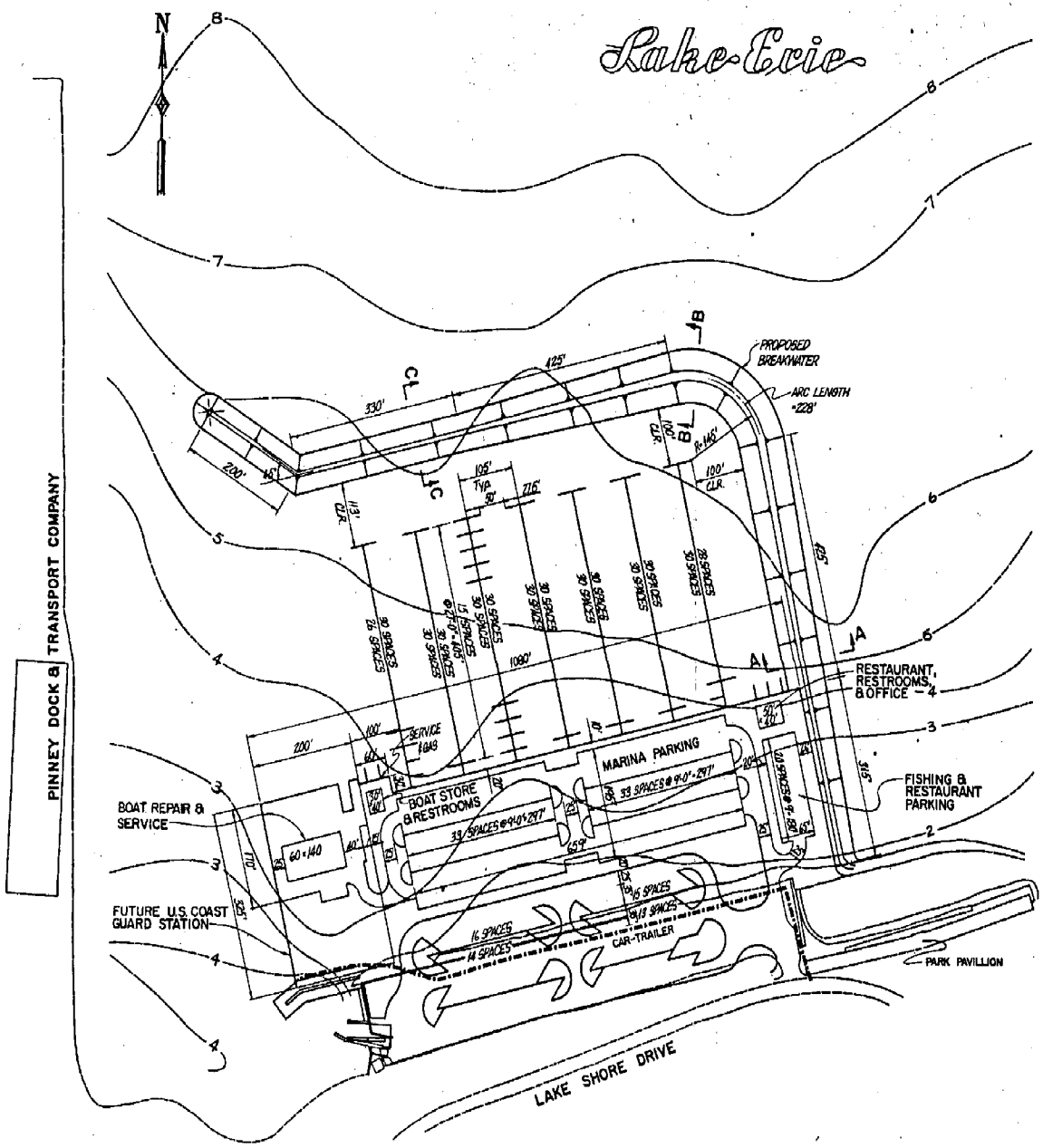

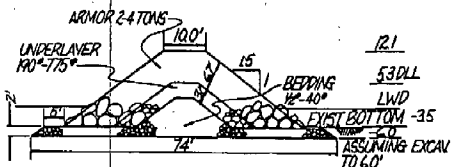

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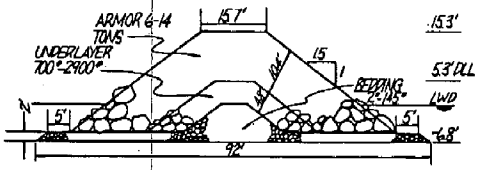

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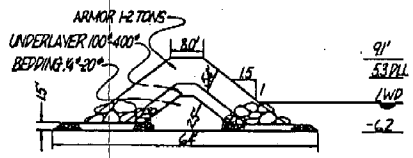

SECTION C-C

ALTERNATE 4 DATA	
NUMBER OF BERTHS	414
NUMBER OF PARKING SPACES:-	
MARINA	396
RESTAURANT/FISHING,	40
CAR-TRAILER	58
RESTAURANT AREA	1,500 S.F.
FACILITIES AREA	1,700 S.F.
MADE LAND AREA	7.2 AC.
BREAKWATER LENGTH	1,925 FT.
BULKHEAD LENGTH	1,755 FT.
VOLUME OF FILL	95,100 C.Y.
PAVEMENT AREA	23,380 S.Y.
ESTIMATED CONSTRUCTION-COST 1979	$ 5,715,300

NOTE: ELEVATIONS SHOWN ARE IN FEET BELOW LOW WATER DATUM. LOW WATER DATUM =568.6 IGLD, 570.5 USGS

NOTE: AREA SOUTH OF -·-·-·- LINE BY OTHERS

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

ALTERNATE 4

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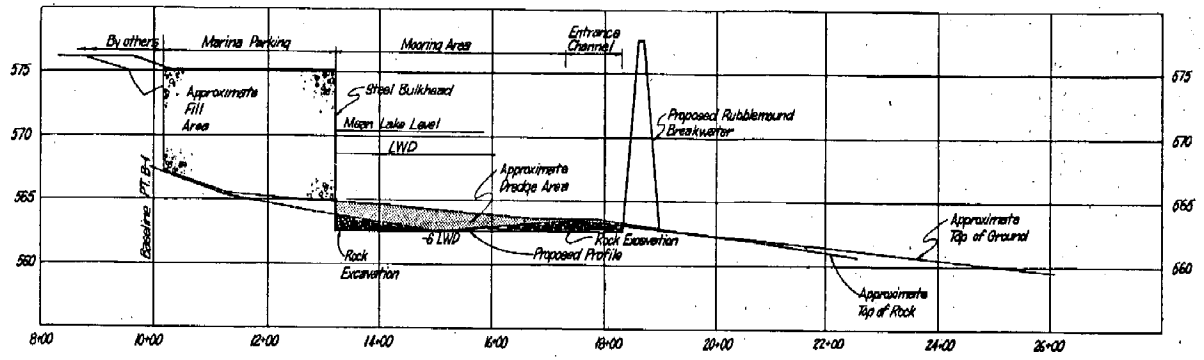

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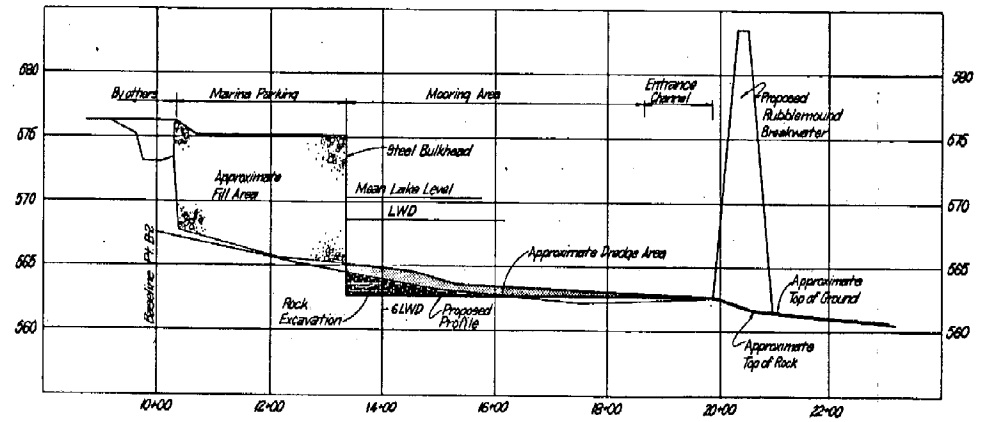

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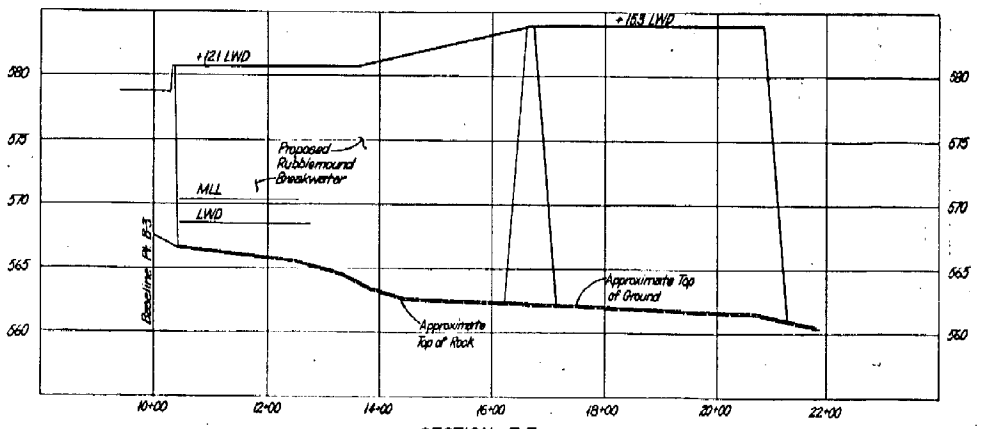

SECTION F-F

NOTE: ELEVATIONS SHOWN ARE IN FEET ABOVE MEAN WATER LEVEL AT FATHER POINT QUEBEC (INTERNATIONAL GREAT LAKES DATUM, 1955) LWD = 568.6' IGLD

WOODRUFF, INC.
CONSULTING ENGINEERS
CLEVELAND, OHIO

LAKE SHORE PARK MARINA

SECTIONS FOR ALTERNATE 3

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APPENDIX C

SOIL REPORT

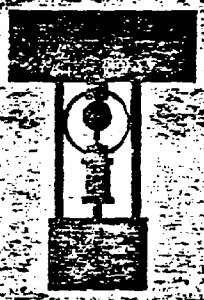
REPORT OF SUBSURFACE INVESTIGATION

FEASIBILITY STUDY

ASHTABULA MARINA

ASHTABULA, OHIO

SEPTEMBER 15, 1980



TRIGGS & ASSOCIATES, INC.
CONSULTING GEOTECHNICAL ENGINEERS

TRIGGS & ASSOCIATES, INC.
34025 CHARDON ROAD
WILLOUGHBY HILLS, OHIO 44094

CONSULTING ENGINEERS

TEL (216) 585-1320

September 15, 1980

Woodruff, Inc.
23875 Commerce Park Road
Beachwood, Ohio 44122

Attention: Albert Malinak

Ashtabula Marina
Lakeshore Park
Ashtabula, Ohio
Triggs #08143

Gentlemen

We have completed our subsurface investigation and laboratory testing of soils, lake sediments, and rock at the proposed marina site. The results from the field investigation and laboratory tests are presented in this report.

FIELD AND SUBSURFACE INVESTIGATION

Three soil test borings, B-1, B-2, and B-3 were made 10 ft. into rock at the locations shown on the attached Boring and Testing Location Plan. Split-spoon samples (SS), were obtained from the soils above rock following ASTM specifications D-1586 at the intervals shown on the attached laboratory boring logs. Ten feet of NX size shale cores were obtained at each boring location.

Fifteen testing locations on Lake Erie, S-1 through S-15, are shown on the Boring and Testing Location Plan. Testing at these locations was done from a small boat. Specific field tests at each location are indicated on the location plan. Split-spoon samples (SS), were obtained by hand pushing the SS sampler through sediment until refusal on shale occured. The SS sampler is capable of retaining samples 24 inches long. Eckman Dredge samples of lake bottom surface sediments were taken at locations marked with an (E), which includes all test locations having sediments and several locations where sediment does not cover the shale. A piece of flat shale was recovered by Eckman Dredge at S-10. At locations where the split-spoon sampler was not used to sound for the shale surface, a steel pipe probe, (P), was used. The probe was hammered with a sledge to assure that

contact with the shale had been made.

The surface elevations at each boring location were measured using differential leveling techniques. The elevation assigned to the Bench Mark, (BM. elev. 583.0), the southwest corner on the concrete floor slab of the pavilion, was back calculated from the Lake Erie surface elevation for August 22 and 23, 1980. All other elevations were then referenced to the Bench Mark. The location of the Bench Mark is shown on the Boring and Testing Location Plan. The lake surface elevation used was obtained from the Army Corps of Engineers (Buffalo District). The closest Lake Erie surface gauge reading that the Corps had at the time of this report was for Cleveland.

The ground and sediment surface elevations along with the top of shale elevations at each boring and testing location are tabulated in Table 1. At sample locations S-7, S-9, S-10, S-11, S-12, S-13, S-14, and S-15, the ground surface and top of shale elevations are the same.

LABORATORY TEST RESULTS

All soil, lake sediment, and shale samples were visually classified in the laboratory by a geotechnical engineer. Samples were tested by the following schedule:

TEST	SAMPLE LOCATION	SAMPLE TYPE
Water Content	B-1, B-2, B-3	All split-spoon samples, 7 total
Uniaxial Compression of Shale Cores	B-1, B-2, B-3	NX Cores, 5 total
Grain Size Distribution Mechanical & Hydrometer	S-1, S-5, S-8	Eckman Dredge, 3 total
Organic Content	S-2, S-5, S-8	Eckman Dredge, 3 total
5 Heavy Metals	S-1, S-5, S-8	Eckman Dredge, 3 total
Oil & Grease	S-1, S-5, S-8	Eckman Dredge, 3 total
Shear Strength	S-8	Eckman Dredge, 1 total

Split-spoon samples were visually classified to be the same as their corresponding Eckman Dredge samples.

The laboratory test results are shown on the following logs and tables.

TEST	RESULTS LOCATION
Water Contents	Laboratory Boring Logs B-1, B-2, B-3
Grain Size Distributions	Table 2
Organic Contents	Table 3
Heavy Metals	Table 4
Oil & Grease	Table 5
Uniaxial Compressive Strength NX shale cores	Table 6 and Laboratory Boring Logs B-1, B-2 and B-3

The laboratory tests for heavy metals and oil & grease were performed by Environmental Resource Associates, Inc. Their cover letter is included before Tables 4 and 5.

Please contact us with any questions you may have on this investigation.

Very truly yours

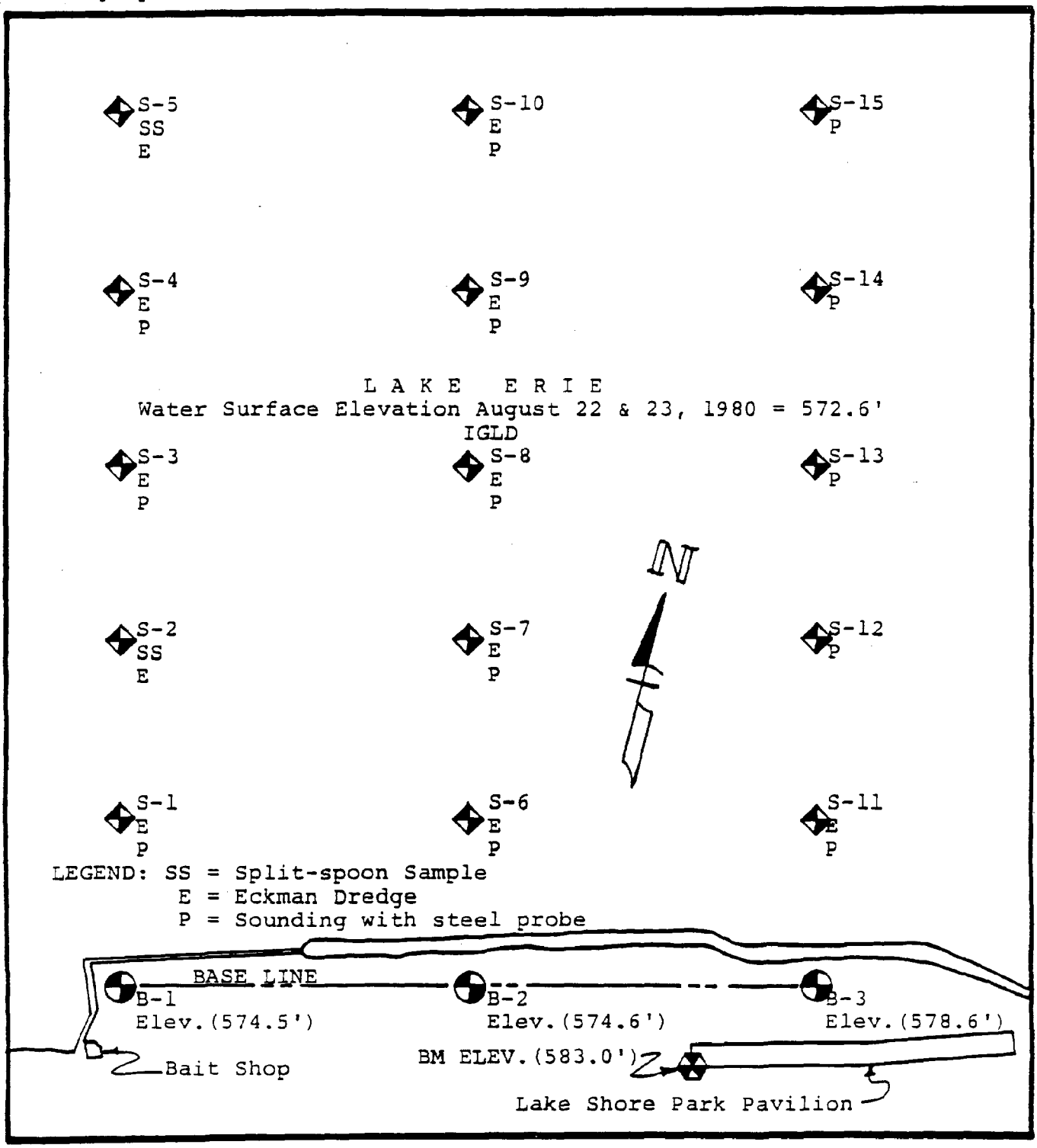
TRIGGS & ASSOCIATES, INC.

J. Fred Triggs, Jr., P.E.

JFTkt

TRIGGS & ASSOCIATES, INC.
Geotechnical Engineers
Willoughby Hills, Ohio

AUGUST 22, 1980
AUGUST 23, 1980



BORING AND TESTING LOCATION PLAN
Scale: 1" = 200'

for

Ashtabula Marina, Lakeshore Park
Ashtabula, Ohio

SOIL AND BEDROCK CLASSIFICATION CHART

SOIL		BEDROCK	
SYMBOL	CLASSIFICATION	SYMBOL	CLASSIFICATION
	TOPSOIL ORGANIC SOIL ORGANIC CONTAMINATION		SHALE
	SAND, sandy		SANDSTONE
	GRAVEL		CONGLOMERATE
	SILT		LIMESTONE
	silty		DOLOMITE
	CLAY		COAL
	clayey		

BORING LOG TERMINOLOGY

SS	2" O.D. SPLIT-SPOON SAMPLE.
ST	3" O.D. THIN-WALL SHELBY TUBE SAMPLE.
NX	2.125" DIA. CORE SAMPLE FROM DOUBLE TUBE CORE BARREL.
SPLIT-SPOON PENETRATION	THE NUMBER OF BLOWS OF A 140 lb. HAMMER FALLING 30 in. REQUIRED TO DRIVE A SPLIT-SPOON SAMPLER THROUGH EACH OF THREE SIX INCH INCREMENTS OF PENETRATION THROUGH SOIL OR ROCK.

TRIGGS & ASSOCIATES, INC.
GEOTECHNICAL ENGINEERS
WILLOUGHBY HILLS, OHIO

LABORATORY LOG OF BORING NO. B-1

OWNER Woodruff, Inc. **PROJECT** Ashtabula Marina

LOCATION Ashtabula, Ohio

DRILLING METHOD Solid Auger/NX Core

SURFACE ELEV. 574.5'

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-SPOON PENETRATION blows / 6 in.	UNCONFINED COMPRESSIVE STRENGTH (Tsf)	UNIT DRY WT. lbs. / cu. ft.	PLASTIC LIMIT IN PERCENT	WATER CONTENT IN PERCENT	LIQUID LIMIT IN PERCENT
				GRAVEL, SAND, and CLAY Possible Fill						
	1	SS			3- 4- 5				17.4	
5				Loose gray clayey SILT with little sand and traces of shale fragments						
	2	SS			1- 1- 2				22.7	
	3	NX		Medium to sound, dark gray SHALE with thin mud seams at 8.0' and 11.6'	Cored 5.0' REC.= 96%					
10						150				
	4	NX			Cored 5.0' REC.= 96%					
15						200				
20				Boring stopped @ 17.5' No water encountered in soil above rock.						

BORING DATE August 22, 1980

TRIGGS & ASSOCIATES, INC.

LABORATORY LOG OF BORING NO. B-2

OWNER Woodruff, Inc. **PROJECT** Ashtabula Marina

LOCATION Ashtabula, Ohio

DRILLING METHOD Solid Auger/NX Core

SURFACE ELEV. 574.6'

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-SPOON PENETRATION blows/6 in.	UNCONFINED COMPRESSIVE STRENGTH (T/sq ft)	UNIT DRY WT. lbs./cu. ft.	PLASTIC LIMIT IN PERCENT	WATER CONTENT IN PERCENT	LIQUID LIMIT IN PERCENT
				GRAVEL & CLAY with some silt and organic material. Possible Fill						
	1	SS		Medium to soft, brown and gray silty CLAY with little sand and trace gravel	2- 3- 3				18.7	
5	2	SS			2- 1- 1				18.9	
				Soft to intermediate, dark gray SHALE						
10	3	NX			Cored 5.0' REC.= 94%	150				
				Sound, dark gray SHALE						
15	4	NX			Cored 5.0' REC.= 96%					
20				Boring stopped at 17.5' No water encountered in soil above rock.						

BORING DATE August 22, 1980

TRIGGS & ASSOCIATES, INC

LABORATORY LOG OF BORING NO. B-3

OWNER Woodruff, Inc. **PROJECT** Ashtabula Marine

LOCATION Ashtabula, Ohio

DRILLING METHOD Solid Auger/NX Core

SURFACE ELEV. 578.6'

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-SPOON PENETRATION blows / 6 in.	UNCONFINED COMPRESSIVE STRENGTH (T/sq ft)	UNIT DRY WT. lbs. / cu. ft.	PLASTIC LIMIT IN PERCENT	WATER CONTENT IN PERCENT	LIQUID LIMIT IN PERCENT
				Loose brown and gray silty fine SAND Possible Fill						
	1	SS			4- 4- 3				18.5	
5				Brown SAND, SILT, and CLAY with rock fragments						
	2	SS			5-17-37				18.2	
				Stiff gray silty CLAY with traces to little sand and trace gravel						
	3	SS			4- 5- 8				16.9	
10				Intermediate to sound, dark gray SHALE			160			
	4	NX			Cored 5.0' REC.= 90%					
15				Sound dark gray SHALE						
	5	NX			Cored 5.0' REC.= 98%		210			
20				Boring stopped at 21.5' No water encountered in soil above rock						

BORING DATE August 22, 1980

TRIGGS & ASSOCIATES, IN

TRIGGS & ASSOCIATES, INC.
34025 CHARDON ROAD
WILLOUGHBY HILLS, OHIO 44094

CONSULTING ENGINEERS

TEL (216) 585-1320

August 22 & 23, 1980

TABLE 1: GROUND SURFACE & TOP OF SHALE ELEVATIONS

Location	Top of Ground	Top of Shale
BM	583.0	---
B-1	574.5	567.5
B-2	574.6	567.6
B-3	578.6	567.6
S-1	565.6	564.4
S-2	564.9	562.6
S-3	564.3	563.4
S-4	563.5	562.3
S-5	562.7	560.6
S-6	565.4	565.2
S-7	563.2	563.2
S-8	562.6	562.2
S-9	562.9	562.9
S-10	561.1	561.1
S-11	563.8	563.8
S-12	562.1	562.1
S-13	562.1	562.1
S-14	562.4	562.4
S-15	560.9	560.9

Lake Erie water surface elevation August 22 & 23, 1980 = 572.6 ft.

Ashtabula Marina
Lakeshore Park
Ashtabula, Ohio

TRIGGS & ASSOCIATES, INC.
34025 CHARDON ROAD
WILLOUGHBY HILLS, OHIO 44094
CONSULTING ENGINEERS
TEL (216) 585-1320

September 10, 1980

TABLE 2: GRAIN SIZE DISTRIBUTION

Sample	Percent Finer Than			
	2.0mm (#10)	.425mm (#40)	.075mm (#200)	.005mm (Hydrometer)
S-1, E	100.0	99.9	44.9	2.0
S-5, E	100.0	100.0	85.3	5.0
S-8, E	100.0	99.6	40.5	7.0

August 29, 1980

TABLE 3: ORGANIC CONTENT

Sample	Percent Organic
S-2, E	1.1
S-5, E	1.3
S-6, E	1.0

S-# = Sample Location
E = Eckman Dredge

Ashtabula Marina
Lakeshore Park
Ashtabula, Ohio

ENVIRONMENTAL RESOURCE ASSOCIATES, INC.
Bohannon Science Center • 20700 North Park Blvd. • University Heights, Ohio 44118 • (216) 321-0933

8 September 1980

Ms. Louise Shook
Triggs and Assoc.
34025 Chardon Rd.
Willoughby Hills, Ohio 44094

Ms. Shook,

Attached are the results of our analysis of the three sediment samples from Ashtabula, Ohio. Heavy metals were extracted in accordance with US Army Corps of Engineers methods (Buffalo District). Oil and Grease analyses were done according to USEPA methods.

We have enjoyed working with you on this project and hope to be of further service in the future.

Sincerely,

Dr. Andrew White
President

August 9, 1980

TABLE 4 : HEAVY METALS

SAMPLE #	ARSENIC	BARIUM	CADMIUM	CHROMIUM	LEAD	MERCURY	SELENIUM	SILVER
S-1, E	<.1 ppm	1.5 ppm	<.05 ppm	<.01 ppm	<.01 ppm	.143ppb	<.1 ppm	< .1 ppm
S-5, E	<.1	1.1	<.05	<.01	<.01	.241 ppb	<.1	<.01
S-8, E	<.1	1.3	<.05	<.01	<.1	.350 ppb	<.1	<.01

TABLE 5 : OIL AND GREASE

(EXPRESSED FOR DRY WEIGHT SEDIMENTS)

SAMPLE S-1, E	SAMPLE S-5, E	SAMPLE S-8, E
232.09 mg/kg	231.60 mg/kg	203.53 mg/kg

S- # = SAMPLE LOCATION
E = ECKMAN DREDGE

ASHTABULA HARBOR
LAKESHORE PARK

TRIGGS & ASSOCIATES, INC.
34025 CHARDON ROAD
WILLOUGHBY HILLS, OHIC 44094

CONSULTING ENGINEERS

TEL (216) 585-7500

August 25, 1980

TABLE 6: UNIAXIAL COMPRESSION TEST RESULT FOR SHALE CORES, NX

Boring Location	Depth, feet	Diameter, inches	Length, inches	L/D	Compressive Strength, KSF
B-1	10.8	2.048	4.0	2.0	300
B-1	16.5	2.050	4.0	2.0	400
B-2	10.6	2.050	4.9	2.4	300
B-3	12.6	2.050	4.0	2.0	320
B-3	19.5	2.051	5.5	2.7	420

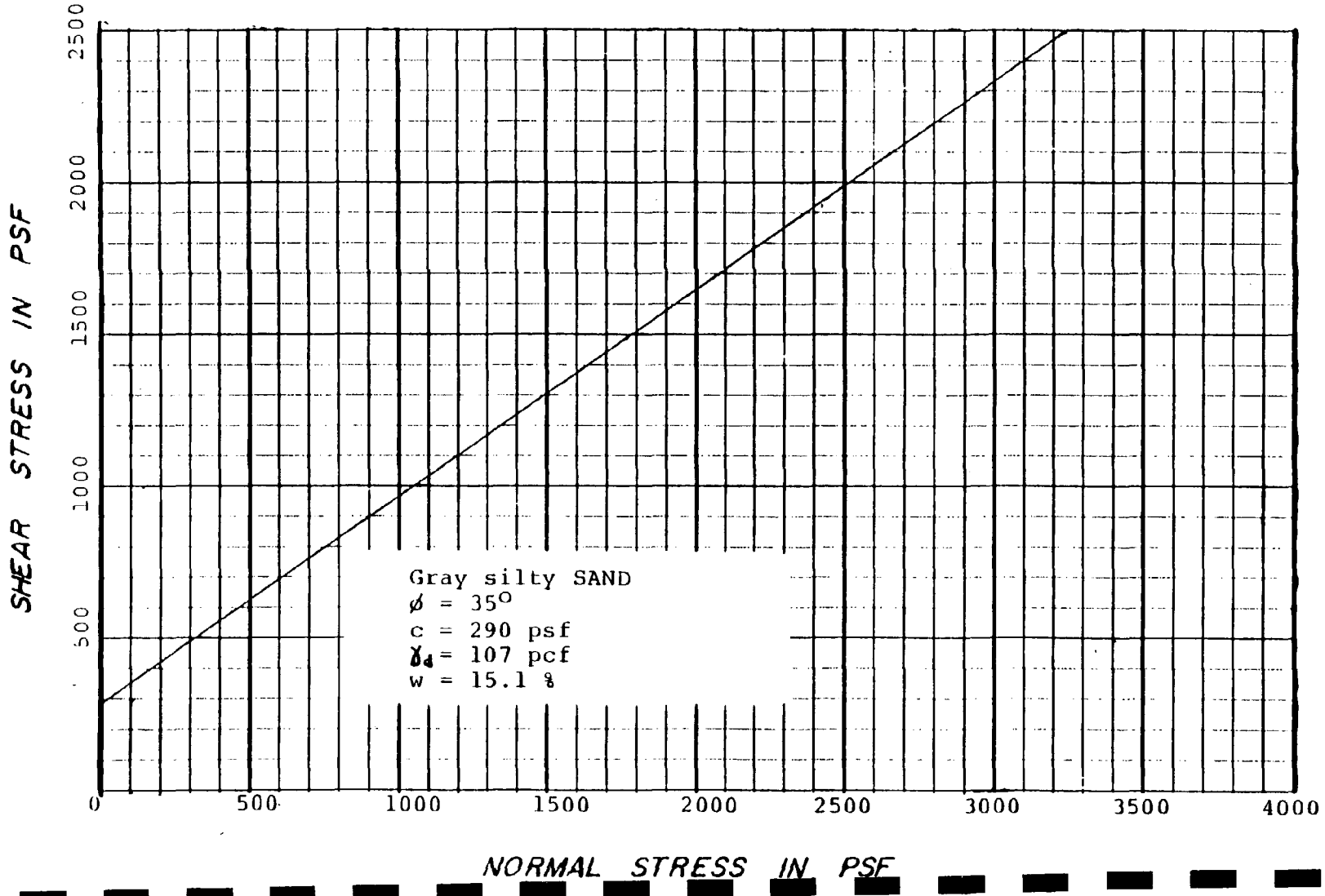
Ashtabula Marina
Lakeshore Park
Ashtabula, Ohio

ASHTABULA MARINA

S-8, E

9/10/80

TRIGGS & ASSOCIATES
WILLOUGHBY HILLS, OHIO



SHEAR STRENGTH DATA SHEET

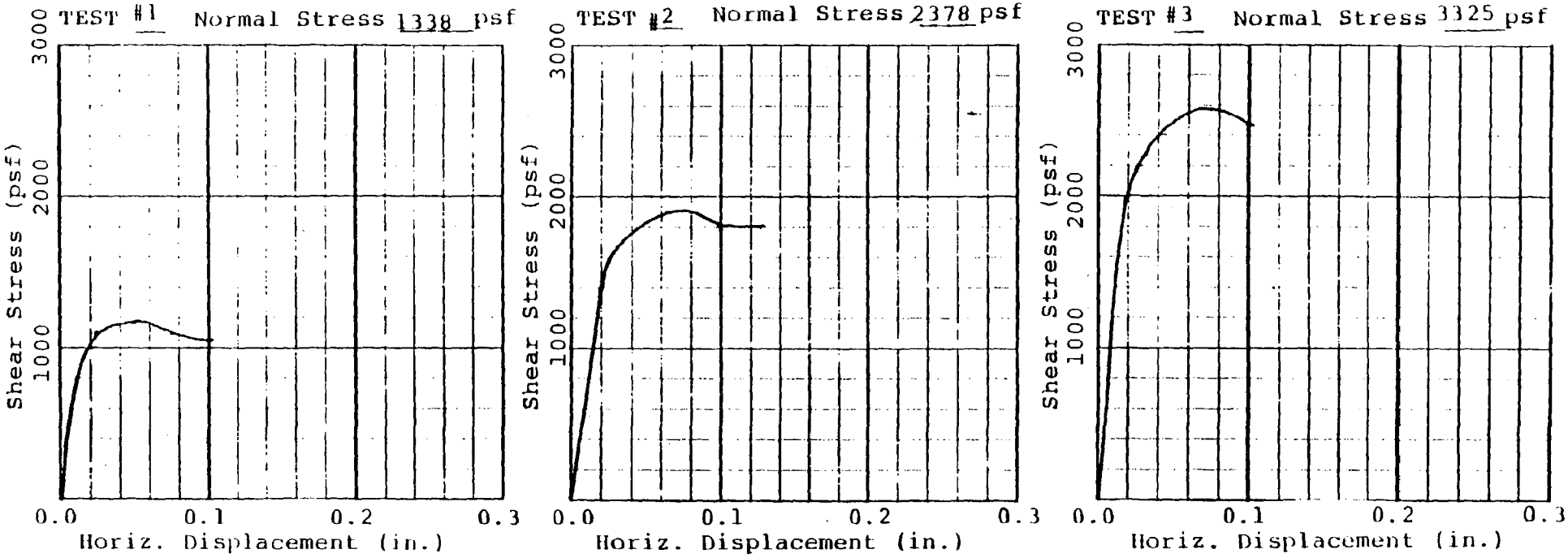
DIRECT SHEAR TEST RESULTS

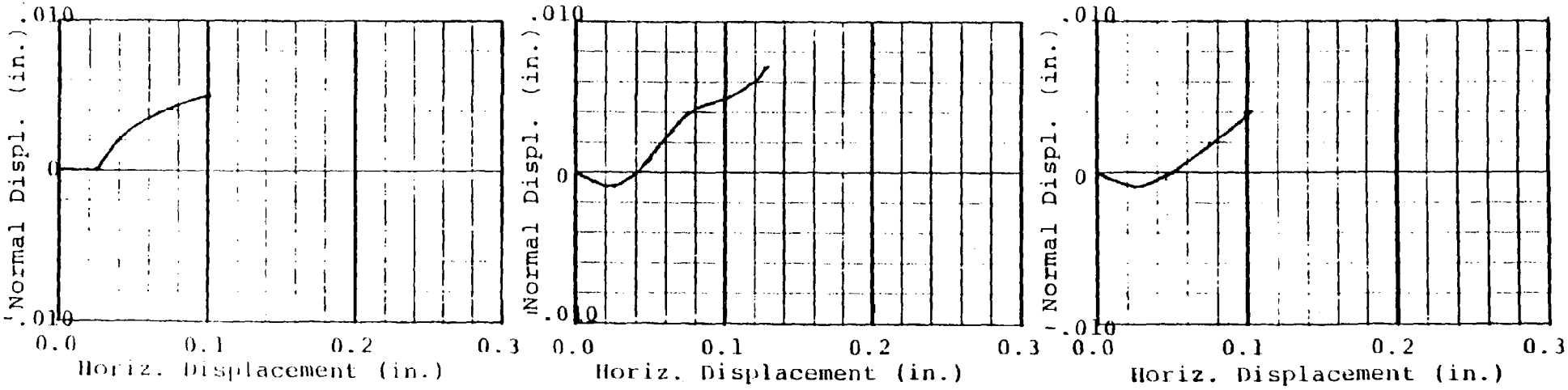
ASHTABULA MARINA

9/10/80

BORING S-8 DEPTH

SOIL Gray silty SAND





APPENDIX D

PRELIMINARY SECTION 404 (B) EVALUATION

BEACH EROSION AND

SHORELINE PROTECTION PROJECT

LAKESHORE PARK

ASHTABULA, OHIO

DEPARTMENT OF THE ARMY

BUFFALO DISTRICT, CORPS OF ENGINEERS

1776 NIAGARA STREET

BUFFALO, NEW YORK 14207

AUG 26 1980

PUBLIC NOTICE

BEACH EROSION AND SHORELINE PROTECTION PROJECT

LAKESHORE PARK, ASHTABULA, OHIO

1. This Public Notice has been prepared and distributed to identify what dredged or fill materials will be discharged into waters of the United States by implementation of the proposed project, and to provide an opportunity for any person affected by such discharge of materials, to request a public hearing.

2. Authorization - Section 103(a) of the 1962 River and Harbor Act, as amended, authorized the Corps of Engineers to assist in the construction of works for the restoration and protection against erosion by waves and currents of the shores of the Great Lakes.

3. Reports and Recommendations - The Buffalo District will release a Draft Stage III Detailed Project Report and Draft Environmental Impact Statement in November 1980, describing two preferred plans for Lakeshore Park. These are Alternative 1 (No Federal Action); and, Alternative 2 (Modified) (consisting of a three-offshore breakwater system protecting an 800-foot reach of backfill). A public meeting concerning the information supplied in the draft reports is tentatively scheduled for December 1980 at the Kent State University auditorium in Ashtabula, OH (precise information will be released prior to the meeting taking place).

4. Based upon technical, environmental, and economic criteria, as well as significant public input, I have concluded that it is in the best public interest to recommend Alternative 2 (Modified) as the tentatively selected plan.

5. Alternative 2 (Modified) - The proposed project would provide protection to the shoreline from further erosion and provide increased swimming opportunities at the park. Three breakwaters would be constructed at the 5-foot± contour or at lake bottom elevation 561.6 (IGLD) which is approximately 500 feet offshore of the restored beach. Each breakwater would be 150 feet long with 250-foot gaps between them (Plate 1). The central breakwater would be approximately parallel to the shoreline while the eastern and western breakwaters would be at a slight angle to the shore to provide further protection for the beach during episodes of north-northwesterly or north-northeasterly wave attack. They would be of

rubblemound construction and consist of one layer of stone randomly placed, with an average porosity of 37 percent. A constant crest elevation of +4.5 (LWD) would be used for all the breakwaters along with a crest width of 13.0 feet.

6. The breakwaters would protect an 800-foot long reach of beachfill, located at the foot of existing clay bluffs at the eastern end of the park. The beachfill would rise to elevation 578.6. The berm would be 100 feet wide, fronted by a 1 on 12 foreshore slope as shown in profile A-A on Plate 2. A total of 52,000 cubic yards of clean sand fill would be placed along the entire reach. The loss rate offshore is estimated to be 5,200 cubic yards requiring replenishment on a yearly basis. A permanent access road to the beach from the top of the existing bluff would be built to facilitate the initial placement of the beachfill and subsequent periods of annual nourishment.

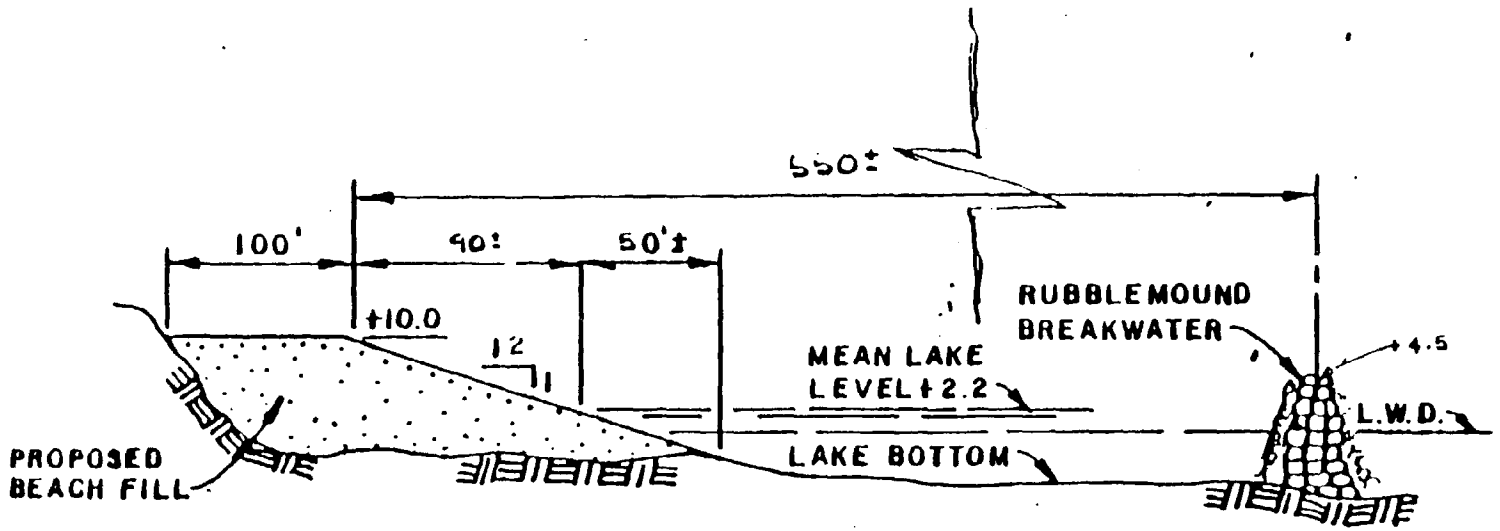
7. Preliminary evaluation (as discussed in the Section 404 Evaluation Report) concludes that the proposed construction of breakwaters and placement of beachfill would not cause unacceptable disruption to the beneficial water quality uses of the affected aquatic ecosystem.

8. This proposed project involves the discharge of fill material into waters of the United States. Therefore, the evaluation of the impact of the activity on the public interest includes application of the guidelines promulgated by the Administrator of the U. S. Environmental Protection Agency (40 CFR, part 230), under the authority of Section 404(b) of the Clean Water Act. Any person who has an interest which might be affected by the proposed discharge may request a public hearing. The request must be submitted, in writing, to the District Engineer within 30 days of the date of this notice and must clearly set forth the interest which may be affected and the manner in which the interest may be affected by this activity.

2 Incl
as stated

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

NOTICE TO POSTMASTER: It is requested that the above notice be conspicuously displayed for 30 days from the date of issuance.



BEACH PROFILE A-A

NOT TO SCALE

NOTE:

MEAN LAKE LEVEL BETWEEN 1900 THRU 1979 IN MONTHS OF JUNE, JULY, AUGUST AND SEPTEMBER WAS +2.2'

SOURCE: "MONTHLY BULLETIN OF LAKE LEVELS FOR THE GREAT LAKES"

ASHTABULA HARBOR, OHIO
LAKESHORE PARK
BEACH RESTORATION STUDY

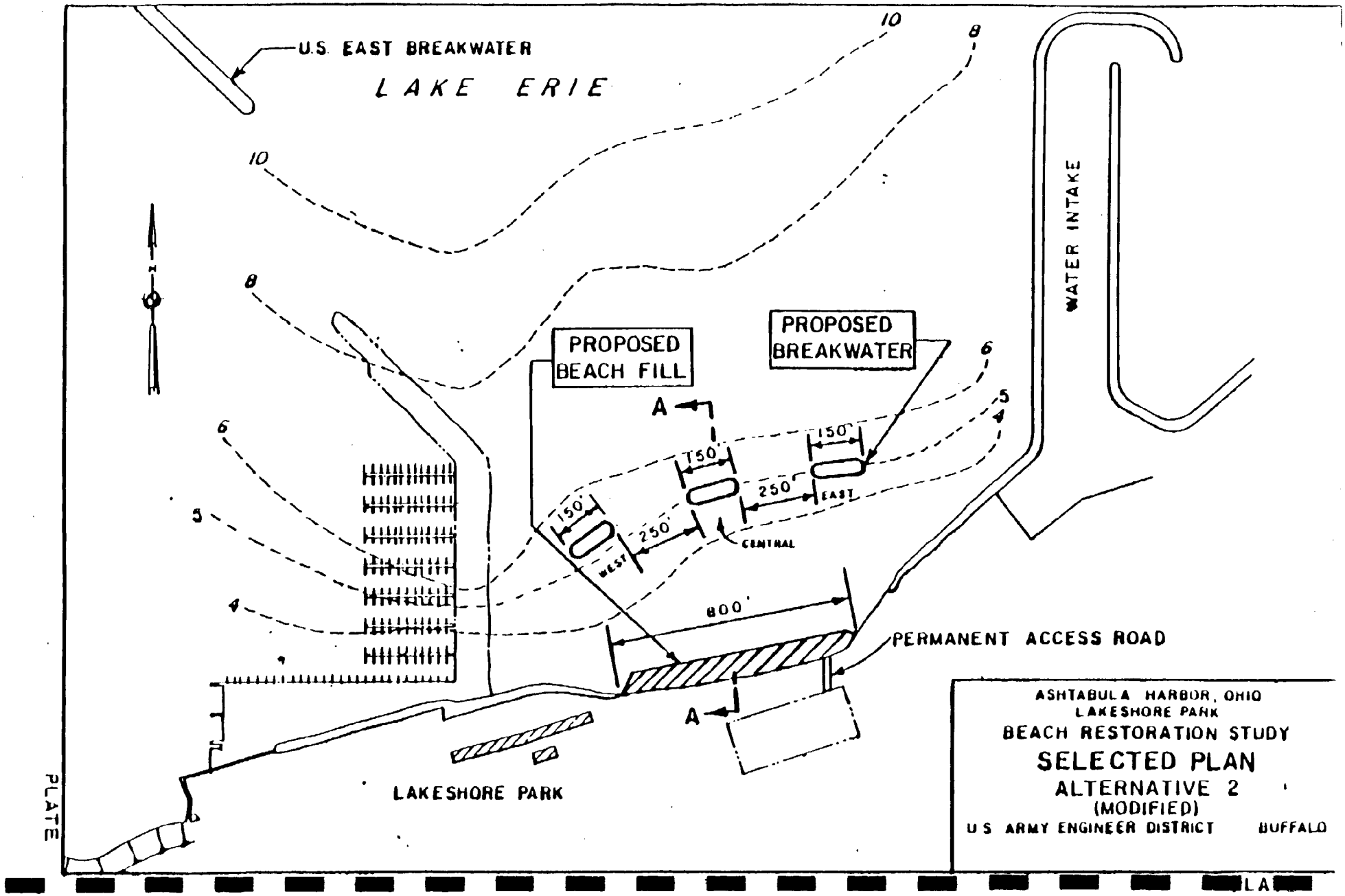
BEACH PROFILE A-A

U. S. ARMY ENGINEER DISTRICT, BUF

PLATE

A-27

PLATE A14


U.S. EAST BREAKWATER
LAKE ERIE
10
8
6
5
4
WATER INTAKE
PROPOSED BEACH FILL
PROPOSED BREAKWATER
A
150'
250'
EAST
CENTRAL
WEST
800'
PERMANENT ACCESS ROAD
LAKESHORE PARK
ASHTABULA HARBOR, OHIO
LAKESHORE PARK
BEACH RESTORATION STUDY
SELECTED PLAN
ALTERNATIVE 2
(MODIFIED)
U S ARMY ENGINEER DISTRICT BUFFALO
PLATE

PRELIMINARY
SECTION 404(b) EVALUATION
BEACH EROSION AND SHORELINE PROTECTION PROJECT
LAKESHORE PARK
ASHTABULA, OHIO

Introduction - Section 404(b)(1) of the Clean Water Act (33 USC 1344) states that each disposal site for dredged or fill material to be discharged into the navigable waters of the United States shall be specified through the application of guidelines developed by the Administrator of the U. S. Environmental Protection Agency (EPA) and the Secretary of the Army. The present Section 404(b)(1) evaluation addresses the construction of offshore breakwaters and the placement of sand beachfill at Lakeshore Park, Ashtabula, OH. The purpose of the project is to eliminate shoreline erosion along 800 feet of clay bluffs and to restore a recreational beach.

1. Project Description. Section 103(a) of the 1962 River and Harbor Act authorized the U. S. Army Corps of Engineers to assist in the construction of works for the restoration and protection against erosion by waves and currents of the shores of the Great Lakes. The proposed plan involves the construction of three offshore, rubblemound breakwaters, each 150 feet long with 250-foot gaps. They would be constructed approximately 500 feet offshore and would protect an 800-foot long reach of beachfill (52,000 cubic yards) placed at the foot of an existing clay bluff. Approximately 10 percent of the beachfill would require renourishment on a yearly basis.

a. Description of the Proposed Discharge of Fill Materials.

(1) Source, Characteristics, and Quantity of Material - Under the selected plan, breakwaters would be constructed with approximately 9,200 tons of angular quarry stone obtained from a nearby commercial source. They would consist of one layer of stone randomly placed, with an average porosity of 37 percent. Each armor unit would weigh approximately 3.5-7.5 tons. Approximately 52,000 cubic yards of sand fill would be placed along an 800-foot reach of shoreline, and would consist of medium-grained, reasonably well-graded, sound, hard, durable, natural sand particles or crushed conglomerate. It would be clean and free of organics, clay, deleterious, or other foreign or objectionable material. The sand would contain no more than 20 percent flat or elongated particles. The loss rate offshore is estimated to be approximately 5,200 cubic yards per year, requiring replenishment on a yearly basis. Sand would be obtained from a nearby commercial source.

b. Description of the Proposed Discharge Site.

(1) Location and Type of Disposal Site - Lakeshore Park occupies approximately 2,500 feet of Lake Erie frontage in the township of Ashtabula, OH (Plate 1). From the east park boundary, low clay bluffs fronted by a narrow gravel beach, extend approximately 800 feet along the shore. Ashtabula Harbor structures to the west and the Cleveland Electric Illuminating Company's intake structure to the east give the offshore area a confined nature.

(2) Methods and Timing of Discharge - Construction of the segmented breakwaters would be accomplished with a marine plant consisting of cranes on barges, scows, and tug boats, whereas, placement of sand fill would require a land plant consisting of dump trucks, front-end loaders, and bulldozers. Construction of this plan would most likely take about 5 months to complete and extend through one construction season. The construction procedure that would probably be followed is to use derrickboats to place the quarry stone which would be transported to the site on scows towed by tug boats. Placement of the stone would be accomplished, utilizing a crane equipped with rock grapples. As the breakwater segments are completed, sand that is truck-hauled to the site can be spread in the lee of the structures to provide the design beach dimensions. As stated earlier, annual beach nourishment would be carried out for the life of the project.

(3) Projected Life of Discharge Sites - The construction of the offshore breakwaters and restoration of a recreational beach would be one time occurrences. However, the annual replenishment of 5,200 cubic yards of beachfill would be continued for the 50-year life of the project.

(4) Bathymetry of Discharge Sites - The breakwaters would be built on a bedrock foundation at a depth of about 5.5+ feet below Low Water Datum (LWD)* or approximately 500 feet from shore. Beachfill would be placed from the clay bluffs to a point 50 feet lakeward of the mean lake level waterline (+2.2 LWD). Existing substrates in both these areas are composed primarily of sand.

2. Physical Effects (40 CFR 230.4-1(a)).

a. Effects on Wetlands (40 CFR 230.4-1(a)(1)). The proposed discharges would have no effect on any wetlands.

b. Impact on the Water Column (40 CFR 230.4-1(a)(2)).

(1) Light Transmission - Construction of offshore breakwaters and placement of beachfill could create short-term increases in turbidity resulting in a temporary reduction in light transmission. This effect would probably be negligible as the littoral zone is normally a fairly turbulent area.

(2) Aesthetic Values - Construction of offshore breakwaters, rising approximately 4.5 feet above LWD, may obstruct further on already confined view of the lake. Beach nourishment would be a departure from the existing shoreline conditions, however, erosion scars along the clay bluffs would be eliminated and the beach would be more aesthetically pleasing.

(3) Direct Effects on Nekton and Plankton - Implementation of either plan component would not produce any destructive effects on nekton or plankton.

*LWD for Lake Erie is 568.6 feet above mean sea level at Father Point, Quebec.

c. Covering of Benthic Communities (40 CFR 230.4-1(a)(3)).

(1) Actual Covering of Benthic Communities - Covering of benthos will occur with both plan components. Breakwaters would cover approximately 0.55 acre along a total length of 450 feet. Beachfill material would be placed both above and below the water level along 800 feet of shoreline. Quantities cannot be accurately specified for any placements other than the initial placement, which would be 52,000 cubic yards of material expected to cover an estimated 0.43 acre of subaqueous surface. Any offshore transport and subsequent deposition of this material can be expected to be no greater than existing rates.

(2) Changes in Community Structure or Function - The underwater surfaces of the breakwaters would provide significant new habitat for a different assemblage of benthos species. The total area of breakwaters available for colonization is about 0.31 acre, although considerably more habitat would be available in the interstices of rubblemound structures. Active erosion areas such as Lakeshore Park generally have very sparse populations of benthic fauna. The habitat provided on the breakwaters should actually increase the diversity and population size of macrobenthos compared to what is lost by covering the sandy substrate.

d. Other Effects (40 CFR 230.4-1(a)).

(1) Changes in Bottom Geometry and Substrate Composition - Changes would occur, as intended, with the restoration of a recreational beach. Substrate composition will be basically unaltered, except the replenishment material may differ slightly from the native beach sand.

(2) Water Circulation - The construction of three offshore breakwaters may disrupt natural circulation patterns of the nearshore area.

(3) Exchange of Constituents Between Sediments and Water - Because the deposition is inert, no change in biological communities due to exchange of constituents between sediments and overlying water is expected to occur.

3. Chemical-Biological Interactive Effects (40 CFR 230.4-1(b)).

a. Exclusion Criteria. Breakwater construction material is chemically inert and physically immobile under the conditions existing at the lakeshore. These characteristics clearly eliminate the possibility of occurrence of chemical-biological interaction, and any testing specified under 40 CFR 230.4-1(b)(2) and (3) - elutriate testing and bioassay testing, respectively - is not applicable in this instance. Fill material for beach nourishment which is composed predominantly of sand, gravel, or shell having particle sizes compatible with material on receiving shores is excluded from testing under 40 CFR 230.4-1(b)(2) and (3); this category embraces the beach nourishment component of the Lakeshore Park beach erosion control project.

4. Description of Site Comparison (40 CFR 230.4-1(b)).

a. Exclusion Criteria. The breakwater component of the plan includes only a disposal site (no dredging site, since the material is obtained from upland sources), therefore, a comparison of sites is not applicable here. This is also the case for beach nourishment if the material is obtained from upland sources. It is herein decided that beach nourishment material obtained from offshore sources would not be the subject of an inventory of total concentration of critical chemical constituents. Because sand is generally chemically inert, such an inventory would not be of value in a site comparison.

b. Similarly, no site comparison is applicable for a biological community analysis.

5. Applicable Water Quality Standards (40 CFR 230.4-2).

a. Because the fill material is inert, no direct effects upon water quality are anticipated.

b. The nearshore waters of Lakeshore Park are utilized for recreational bathing. The State of Ohio specifies a maximum safe level of fecal coliform organism density, above which use of a bathing beach is not permitted. The water quality at the park is monitored regularly throughout the bathing season; the Ohio Department of Health, in a letter dated 4 June 1980, reported that Lakeshore Park does not show any great pollution hazard, although there are occasional high counts of bacteria normally due to rainfall.

c. Breakwater construction implemented to control shoreline erosion may cause a degradation in water quality by lessening circulation along the shore, resulting in a tendency towards stagnation, with a concomitant increase in the concentration of coliform bacteria originating either from the bathers or from outside sources. As an item of local cooperation, the Ashtabula Township Park Commission has agreed to assure that water pollution that would affect the health of bathers will not be permitted.

6. Selection of Disposal Site for Fill Material (40 CFR 230.5).

a. Need for the Proposed Activity. The proposed activity is intended to eliminate shoreline erosion along 800 feet of erodible bluffs and restore a recreational beach at Lakeshore Park.

b. Alternate Sites Considered. Breakwaters and beach replenishment material are planned to be placed at locations which are considered to be the best sites to satisfy the need for beach erosion control.

c. Objectives in Discharge Determination. Objectives determined in discharge determination (40 CFR 230.5(a)) including the following impacts on

chemical, physical, and biological integrity of aquatic ecosystems evaluated in terms of their impact upon water uses at the discharge site (40 CFS 230.5(b)(1-10)), and incorporating considerations to minimize harmful effects (40 CFR 230.5(c)(1-7)):

(1) Impact on Food Chain - Construction of breakwaters and placement of beachfill would have an insignificant impact upon the food chain. After construction, the breakwaters would provide a more diverse habitat, thereby increasing the variability of the local aquatic food chain.

(2) Impact on Diversity of Plant and Animal Species - The breakwaters should act as artificial reefs, providing substrate for attachment of algae and invertebrate animal communities, and protective cover for fish. This should result in an increase in diversity of plant and animal species.

(3) Impact on Movement into and out of Feeding, Spawning, Breeding, and Nursery Areas - Breakwaters would cover approximately 0.55 acre of possible yellow perch spawning areas. Approximately 0.31 acre of new, more diverse habitat would be added on the submerged surfaces of the structures.

(4) Impact on Wetland Areas Having Significant Functions of Water Quality Maintenance - There would be no impact on any wetlands.

(5) Impact on Water Retention Areas - There would be no impact on areas which serve to retain natural high waters or flood waters.

(6) Methods to Minimize Turbidity - Turbidity increases during construction may occur which would be minimized, as necessary, by environmental protection aspects of construction requirements.

(7) Methods to Minimize Degradation of Aesthetic, Recreational, and Economic Values - Degradation of aesthetic values is minimized in the breakwater plan component by limiting, to whatever extent possible, the height and length of the breakwaters, and providing maximum possible spacing of the structures. The use of rubblemound breakwaters should provide a more natural appearance than would other types, e.g., steel sheet pile. Within the beach replenishment plan component, aesthetic value degradation would be minimized by utilizing the most natural-appearing suitable beachfill which is available and consistent with favorable plan economics. Minimization of degradation of recreational values is a major planning objective of the beach erosion control project. The protection of and subsequent recreational development at Lakeshore Park should enhance local land values.

(8) Threatened and Endangered Species - There would be no impact on threatened or endangered species.

d. Impact on Water Uses (40 CFR 230.5(b)(1-10)).

(1) Municipal Water Supply Intakes - No impacts on municipal water supply intakes would occur.

(2) Shellfish - No significant impact on shellfish would occur.

(3) Fisheries - Approximately 0.55 acre of possible yellow perch spawning area would be covered by breakwater construction.

(4) Wildlife - No significant impact on wildlife would occur.

(5) Recreation Activities - Existing recreation activities would be temporarily disrupted during project construction and annual beach nourishment. No significant, long-term increases in turbidity, nutrients, pathogenic organisms, or oil and greases are expected to occur.

(6) Impact on Threatened and Endangered Species - The proposed discharges would have no effect on threatened or endangered species habitats as defined in the Endangered Species Act.

(7) Impact on Benthic Life - Breakwater construction would cover approximately 0.55 acre and placement of beachfill would cover 0.43 acre of benthic habitat. The rubblemound breakwaters, however, would enhance the existing benthic community by adding at least 0.31 acre of new, more diverse habitat.

(8) Impact on Wetlands - The proposed activity would have no effect on wetlands.

(9) Impact on Submersed Vegetation - The proposed activity would have no significant effect on submersed vegetation.

(10) Size of Disposal Site - The size of the breakwaters and the beach are the minimum necessary to provide shoreline erosion protection and recreational swimming opportunities.

(11) Coastal Zone Management - The proposed activity does not conflict with the State of Ohio's proposed coastal zone management program.

e. Considerations to Minimize Harmful Effects (40 CFR 230.5(c)).

(1) Water Quality Criteria - During construction, the Contractor would be required to minimize turbidity and accidental spills of fuels, oils, greases, etc. Open flanks, voids in the stone, and gaps between the breakwaters should lessen impacts upon water circulation. After construction, the Ohio Department of Health would continue to monitor water quality during the bathing season to insure that water quality at the park does not present a health hazard to the bathers.

(2) Alternatives to Open Water Disposal - Alternatives which do not provide a recreational beach (e.g., sheet pile wall, abandonment) have been eliminated for economic reasons.

(3) Physical Characteristics of Alernative Disposal Sites - Not Applicable.

(4) Ocean Dumping - Not Applicable.

(5) Covering Contaminated Material with Cleaner Material - Breakwater armor units and beachfill would be inert and clean and would require no covering.

(6) Minimize Effect of Runoff from Confined Areas on the Aquatic Environment - Not Applicable.

(7) Coordination of Potential Monitoring Activities with EPA - Not Applicable.

7. Statement as to Contamination of Fill Materials if from a Land Source (40 CFR 230.5(d)). Fill material would be clean and inert (See Section 1.a.(1)).

8. Mixing Zone Determination. Since the fill material would be clean and inert, the determination of the mixing zone would not be applicable.

9. Conclusions and Determinations.

a. I have reviewed the documents pertinent to the construction of offshore breakwaters and a recreational beach at Lakeshore Park, OH, and have concluded that:

(1) An ecological evaluation has been performed following the evaluation guidance contained in 40 CFR 230.4, in conjunction with the evaluation considerations in 40 CFR 230.5 (40 CFR 230.3(d)).

(2) Appropriate measures have been identified and incorporated into the proposed plan to minimize adverse effects on the aquatic environment as a result of the placement of fill material (40 CFR 230.3(d)(1)).

(3) Consideration has been given to the need for the proposed activity, the availability of alternative sites and methods of discharge that are less damaging to the environment, and such water quality standards as are appropriate and applicable by law (40 CFR 230.5).

(4) No wetlands would be affected by construction of the project (40 CFR 230.5(b)(8)).

10. Findings. I find that the discharge of 52,000 cubic yards of beachfill material and subsequent annual nourishment, and the construction of three offshore breakwaters at Lakeshore Park, OH, have been specified through application of Section 404(b)(1) of the Clean Water Act guidelines.

GEORGE P. JOHNSON
Colonel, Corps of Engineers
District Engineer

Date 8/22/80